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ABSTRACT

A study of progress in the Edison Elementary School (California) bilingual immersion program after its first year of implementation looked at: (1) student levels and gains in first and second language proficiency; (2) levels of math and reading achievement and their possible relationship to student language background; (3) levels of students' perceived academic, peer, physical, and mother-child relationship competencies; and (4) attitudes toward the program among parents and staff. A total of 58 kindergarten and 54 first-grade students participated. Pre- and post-test comparisons of achievement showed that all students made gains in both Spanish and English, with more Spanish-dominant than English-dominant students fluent in both languages. Overall, both Spanish- and English-dominant students scored above average in content area achievement. Students' perceived interpersonal competence was high in each domain examined, and attitudes toward the program were generally positive. Recommendations include promotion of leadership among teachers, development of a Spanish language arts component, development of an English language arts curriculum, provision of more opportunities for native English- and Spanish-speakers to interact in group work; and inclusion of non-bilingual immersion students in the evaluation. (Author/MSE)

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THE EDISON ELEMENTARY SCHOOL BILINGUAL IMMERSION PROGRAM: STUDENT PROGRESS AFTER ONE YEAR OF IMPLEMENTATION

Kathryn J. Lindholm, Ph.D.

TR9

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CLEAR believes that working toward a language-competent society should be among our nation's highest educational priorities. Thus, CLEAR is committed to assisting both non-native and native speakers of English to develop a high degree of academic proficiency in understanding, speaking, reading, and writing in English and a second or native language. To work toward this goal, CLEAR has united researchers from education, linguistics, psychology, anthropology, and sociology with practitioners, parents, and community agencies.

A coordinated set of research, instructional improvement, community involvement, and dissemination activities are oriented around three major themes: (a) improving the English proficiency and academic content knowledge of language minority students; (b) strengthening second language capacities through improved teaching and learning of foreign languages; and (c) improving research and practice in educational programs that jointly meet the needs of language minority and majority students.

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EXECUTIVE SUMMARY

This report presents the results of a study of Edison Elementary School after its first year of implementing the bilingual immersion program. The major research questions sought to determine: (1) the levels of first and second language proficiency and whether there were gains in first and second language proficiency over the year; (2) the levels of math and reading achievement in Spanish and English and whether there were achievement differences related to the language background of the students; (3) the levels of students' perceived academic, peer, physical and mother-child relationship competencies; and (4) attitudes toward the bilingual immersion program among the parents and staff.

A total of 112 children, 58 at the kindergarten and 54 at the first-grade level, participated in the study. Data were gathered on English and Spanish proficiency with pre- and post-test measures; English and Spanish achievement, with pre- and post-test measures in Spanish; and perceived competence. In addition, the data collection included a parent questionnaire and a bilingual immersion staff questionnaire. Also, 20 kindergarten and 19 first-grade students who were not enrolled in the bilingual immersion program were tested using the English achievement test.

In terms of language development, all students made gains in both languages. Native language proficiency was high, with about two thirds of the students rated at the Fluent Proficiency level, and one third at the Limited Proficiency level. Second language proficiency varied considerably, with some students rated at the Non-Proficient level, others at the Limited Proficient level, and still others at the Fluent Proficient level. More Spanish-dominant students were fluent in the second language than were English-dominant students.

Both the Spanish-dominant and English-dominant students scored at an average to above average level in achievement performance. The Spanish-dominant speakers scored as average to above average on Spanish achievement tests and made significant gains from the fall to the spring. Even the English-dominant students scored well on the Spanish achievement tests; the kindergartners scored average in reading and slightly above average in math, but the first graders scored above average in reading and well above average in math. In addition, the first graders made significant progress from the fall to the spring. On English achievement tests, the Spanish-dominant kindergartners scored below average but the first graders performed only slightly below average, and they did not differ significantly from the non-bilingual immersion students. The English-dominant kindergartners scored slightly below average, but the first graders performed average in reading and language and slightly above average to well above average in math. Furthermore, on every subtest, the English-dominant kindergartners scored higher than the non-bilingual immersion students, with significantly higher scores in math.

The students' perceived competence ratings were high in each of four domains (academic, peer, physical, and mother-child relationship); and attitudes toward the bilingual immersion program were generally positive from the parents and teachers.

Several important points should be made about the results that have implications for the bilingual immersion model. First, the Spanish speakers at both grade levels made highly significant gains in English and the English

speakers demonstrated some gain in English proficiency. Thus, despite the small amount of English instruction, most students were able to make gains in English language proficiency. Second, all students made gains in Spanish proficiency and the gains were highly significant for the Spanish-speaking kindergartners. These are important results because they demonstrate that the bilingual immersion model's assumptions related to language development were accurate; that is, Spanish speakers increased their level of Spanish proficiency and began to develop some proficiency in English, and English speakers did not lose their English proficiency while acquiring Spanish proficiency skills.

A second set of important points concerns the achievement performance of the students. First, the English-speaking students acquired enough content after only one year of instruction through Spanish to be able to score average to above average in a test normed for native Spanish speakers. Second, the Spanish speakers performed from average to above average on the Spanish achievement test, demonstrating a good level of performance for these students when tested in their native language. Third, the English-speaking kindergartners and the Spanish-speaking first graders scored average to only slightly below average in English reading and math; and the English-speaking first graders scored average to above average in reading, language, and math. The fact that these students were able to score this high in English reading and math, despite having received their instruction in Spanish, demonstrates that the students were acquiring the math concepts in Spanish, and they were able to apply these concepts when tested in English. Thus, the achievement results also validate the achievement assumptions underlying the bilingual immersion model in that the model assumes that content that is learned in Spanish will be available in English as well. The fact that the students were able to score as well as they did demonstrates that the concepts were available to them in both languages.

The findings from Edison were comparable to the results reported by the San Diego City Schools (Lindholm, 1987a; ESEA Title VII Bilingual Demonstration Project, 1982) and three other bilingual immersion programs in California (Lindholm, 1987b). The consistency of the findings across other school sites also adds validity to the achievement and language assumptions underlying the bilingual immersion model.

Five recommendations were made to further develop the bilingual immersion program at Edison: (1) To promote strong leadership and ownership of the program among the teachers; (2) to develop a Spanish language arts component; (3) to develop a curriculum for English language arts; (4) to provide more opportunities for native English and native Spanish speakers to interact in group work; and, (5) to include the non-bilingual immersion students in the evaluation.

In conclusion, the language proficiency and academic achievement first-year data demonstrated that the bilingual immersion model is an effective language education model for both language minority and language majority students. However, the success of the students over the next two to three years in acquiring academic competence will be contingent on the degree to which the program is fully developed according to the 13 criteria discussed for successful bilingual immersion programs.

THE EDISON ELEMENTARY SCHOOL BILINGUAL IMMERSION PROGRAM: STUDENT PROGRESS AFTER ONE YEAR OF IMPLEMENTATION

INTRODUCTION

Bilingual immersion education combines the most significant features of bilingual education (for language minority students) and immersion education (for language majority students). Academic and language arts instruction is provided to students through two languages, taught in separate class periods. For language minority (i.e., non-English-dominant) students, most of their academic instruction is presented through their first language, Spanish, and they receive English language arts and portions of their academic instruction in English. For language majority (i.e., English-dominant) students, most of their academic instruction is through their second language, Spanish, and some in English, and their training in language arts is conducted in separate English and Spanish class periods.

Bilingual immersion education therefore encompasses two key features: (1) the program essentially involves some form of dual language immersion, with periods of instruction transpiring in one language only; and (2) both English-dominant and non-English-dominant speakers are participants (ideally in balanced numbers). These programs, therefore, attempt to develop true bilingual academic competence in English and another language for both groups of participating students.

This report presents the results of a study, conducted by the Center for Language Education and Research (CLEAR) at the University of California, Los Angeles, of the bilingual immersion program at Edison Elementary School, a school within the Santa Monica-Malibu Unified School District in California. CLEAR's objective has been to work with Edison School to study and help improve their program in language education. This purpose was accomplished through student assessment, classroom observation, and professional development activities.

The focus of this report is on the results of the student assessment and parental and teachers' perceptions of the program. After a review of the literature, the bilingual immersion program, as articulated at Edison Elementary School, is described in detail. The methodology section describes the student and parent samples, the data collection instruments,

and the analytic strategy. The results section examines student performance after one year, including gains/losses in student achievement, comparisons with a non-bilingual-immersion group of students, and student, parent, and staff evaluations. Findings are discussed in terms of the potential value of bilingual immersion programs, and how such programs could be developed and implemented.

REVIEW OF LITERATURE

Carefully conducted analyses have demonstrated that bilingual education programs can be successful in improving the academic performance of students with limited English proficiency (e.g., Krashen & Biber, 1988 cited in "Bilingual Education," 1988; Ramirez, Yuen, Ramey & Merino, 1986; Troike, 1978; Willig, 1985). Bilingual education programs have been most effectively implemented in concert with clear policies regarding implementation and teacher training, and when the programs were designed to promote educational achievement in addition to the mere learning of English. In contrast, research has documented the failure of English-only instructional approaches (i.e., English immersion) to meet the educational needs of language minority students (California State Department of Education, 1982; Hernández-Chávez, 1984; National Assessment for Educational Progress, 1982).

Many educators have therefore rejected English immersion as a suitable educational treatment for language minority students. However, when applied appropriately, non-English immersion education has had very successful results. Evaluations of Spanish immersion programs in the United States and French immersion programs in Canada (Campbell, 1984; Genesee, 1985; Swain, 1984), showed that immersion education programs were highly effective for native English-speaking students. These students demonstrated high levels of proficiency in the second language (i.e., French, German, or Spanish), high academic achievement, and no loss in their English skills.

A number of authors have completed comprehensive reviews of research and evaluation studies concerning bilingual and immersion education (e.g., Baker & de Kanter, 1981; Cummins, 1979, 1983; Diaz, 1983; Dolson, in press; Swain & Lapkin, 1985; Troike, 1978, 1986; Willig, 1985). These reviews have pointed to certain sociolinguistic and instructional factors which contributed to successful dual language programs. The importance of these

found in programs that promoted high levels of first and second language competencies, academic achievement in both languages, and positive psychosocial behavior and cross-cultural attitudes (see Lindholm, 1987a). Thus, these factors form the core criteria for successful bilingual immersion education.

The first ten criteria are essential for successful language education programs while the last three criteria apply to educational programs in general. These last criteria are mentioned here because they are important elements in an educational program and the presence of these criteria cannot be assumed, but rather must be carefully considered in designing and implementing a successful bilingual immersion program (for a more thorough discussion of these criteria, see Lindholm, 1987a and Lindholm & Dolson, 1988).

1. Duration of instructional treatment. The instructional treatment is provided to the participating students for a period of at least four to six years.
2. Exposure to optimal dual language input. Optimal input has four characteristics: (a) it is adjusted to the comprehension level of the learner, (b) it is interesting and relevant, (c) there is sufficient quantity, and (d) it is challenging.
3. Focus on academic curriculum. The programs are designed to focus on subject matter as well as language development. Students are exposed to the same academic core curriculum as students in regular programs, but in more than one language.
4. Integration of language arts with curriculum. Related to criteria 2 and 3 is the need to provide language arts instruction in both the English and non-English languages and to design the instruction so that it is integrated with the academic curriculum.
5. Separation of languages for instruction. Monolingual lesson delivery refers to the amount of time devoted to instruction in each language. This is not to say that language mixing itself is harmful; rather, it appears that sustained periods of monolingual instruction (in each language) helps to promote development in each language.

6. Additive bilingual environment. All students are provided the opportunity to acquire a second language at no cost to their home language and culture.
7. Classroom composition. To maintain an environment of educational and linguistic equity in the classroom and to promote interactions among native and non-native English speakers, the ideal ratio is 50% English speakers to 50% non-native English speakers. The ratio of English speakers to non-native English speakers is important to insure that there are enough language models of each language to promote interactions among the two groups of students.
8. Ratio of English to the non-English language. From studies of bilingual students and immersion students, it appears that a minimum of 50% non-English language instruction is necessary to promote high levels of the non-English language proficiency among language majority students and to promote academic achievement among language minority students. Furthermore, although studies have not addressed the minimal level of English necessary, a minimum of 10% English instruction initially is important to promote English language development for the non-native speakers of English. Also, to develop a high level of academic English language skills among the language minority students, the amount of content instruction in English should be about 50% for the late elementary school years (grades 4-6).
9. Promotion of, and opportunities for, language output. Promoting highly proficient oral language skills necessitates providing both structured tasks and unstructured opportunities involving oral production skills for students to engage in.
10. A positive school environment. A successful bilingual immersion program must have the support of the principal, other administrators, and non-bilingual immersion staff. This support is based on a knowledge of the program, and is demonstrated: (a) through a desire for the program to succeed by an expenditure of resources that is comparable to other educational programs in the school, (b) by devoting attention to promoting acceptance of the

program among the community and other school staff, and (c) by closely integrating the structure and function of the bilingual immersion program with the total school program.

11. Positive and reciprocal instructional climate. This refers to the promotion of positive interactions between teachers and students and between language-minority and language-majority students, including the use of cooperative learning methods. Also, teachers should adopt a "reciprocal interaction model" instead of adhering solely to the "traditional transmission model" of teaching.
12. High quality instructional personnel. Students receive their instruction from certified teachers. They are exposed to a number of teachers who have native or native-like ability in either or both of the language(s) in which they are teaching. Teachers, although bilingual, may assume monolingual roles when interacting with students.
13. Home/school collaboration. Parental involvement and collaboration with the school enhances educational outcomes.

In conclusion, studies have indicated that programs can be designed to simultaneously meet the needs of language-minority and language-majority students by combining the best features of immersion and bilingual education programs. Bilingual immersion programs have served the needs of both native English speakers and native speakers of other languages, and have resulted in language proficiency in both the other language and in English, academic achievement at or above grade level as measured in both languages, and enhanced psychosocial development and cross-cultural attitudes. In doing so, these programs helped to develop citizens who were better prepared to strengthen bonds of national unity in a time of growing ethnic and linguistic diversity, and who were better able to meet the mounting pressures of international competition in a multilingual world where the knowledge of languages other than English is essential.

DESCRIPTION OF THE EDISON PROGRAM

Program History

The Edison Instructional Program Task Force was formed on March 25, 1985, to: (1) review the instructional program at Edison School; (2) examine instructional programs of comparable schools (especially those that

have been recognized for their excellence); (3) review the latest research relevant to bilingual instruction and second language acquisition; (4) address the status of Edison School as a segregated school; and (5) prepare a proposal to the Board of Education with regard to a recommended instructional program (Edison School Task Force, 1985).

The Task Force met a number of times over a ten-month period, during which its members read reports, met with experts in second language education, visited nationally recognized "model" bilingual elementary schools, and consulted with staff of the Center for Language Education and Research (CLEAR) and the California State Department of Education. The Task Force recommended the implementation of a bilingual immersion program at the kindergarten and first-grade levels because it was considered the most promising model to promote high levels of bilingualism, biliteracy, academic achievement, and positive cross-cultural attitudes.

Program Goals

The goals of the bilingual immersion program were to produce:

1. Normal to superior academic achievement in Spanish and English;
2. Development of proficient bilingual and biliterate skills in English and Spanish;
3. High levels of self competence; and
4. Positive cross-cultural attitudes.

Program Design

The program was designed in concordance with the successful ten-year Spanish/English Bilingual Immersion Program in the San Diego City Schools. The specific instructional approach was developed in consultation with CLEAR, the California State Department of Education, the San Diego City Schools, and the Edison Task Force. Its instructional design was based on a careful review of the literature on successful bilingual and immersion education programs in the United States and Canada as discussed previously.

The specific articulation of the bilingual immersion program included four classrooms: two in each of the kindergarten and first-grade levels. In each grade, two classes were bilingual immersion classrooms and the other was a non-bilingual immersion mainstream classroom. The program was administered by the school principal, with oversight and administrative assistance provided by the school's Title VII Program Specialist.

According to the instructional design for the bilingual immersion program, both native English-speaking and native Spanish-speaking kindergarten and first-grade students received 90% of their instructional day in Spanish. One teacher was to provide the Spanish instruction and use only Spanish with the students. For the remaining 10% of the instructional day, teaching was to be carried out in English by another teacher of the same grade. (For the English instruction, each class would move to the classroom of the English-speaking teacher.) Thus, all academic subject matter was taught in Spanish except for English language arts and physical education, which were taught in English. A sample classroom daily schedule appears in Appendix A.

At the kindergarten level, the two kindergarten teachers exchanged classrooms for the English instruction. At the first-grade level, teachers were teamed at the beginning of the year with a non-bilingual immersion teacher for English language arts. Thus, each of the bilingual immersion classes moved to the non-bilingual immersion teacher's class for English language arts. However, this move evidently was very time-consuming, especially for the non-bilingual immersion class which was moved twice a day. Thus, the three teachers decided to exchange classrooms such that each teacher taught each class consecutively for three days. Thus, Teacher A taught class B on day 1, class C on day 2, and her own class on day 3. This change violated criterion 5 of bilingual immersion education discussed previously, which states that bilingual immersion teachers must separate the two languages for instruction so that one teacher uses only one language with the children. Although the teachers had at least weekly contact with CLEAR, this change was never discussed with CLEAR.

The instructional content in the program was equivalent to that for non-participating students at the same grades at Edison. However, schedules were developed for teaching all of the required academic subjects using methods appropriate for students' grade levels, and for enabling both native Spanish-speaking and native English-speaking students to acquire language skills in both languages.

Recruitment and Enrollment Procedures

Recruitment problems were anticipated because the bilingual immersion program was innovative and parents would be naturally concerned about

enrolling their children in a new program. Several approaches were used to recruit students.

A brochure was produced in Spanish and English to provide parents and community members with information about the bilingual immersion program. The brochure contained the following information: A concrete definition of bilingual immersion education, the percentage of use of the two languages within the program, the instructional design, the goals of the program, the advantages of this type of educational program, and a consent form.

In addition, the Edison 1985-86 academic year principal and the Title VII coordinator visited preschools and PTA meetings to talk with parents about the bilingual immersion program. Edison and CLEAR staff met on numerous occasions with parents who were interested in the program and wanted more information.

In the beginning of the fall, 1986 semester, the Title VII coordinator met with many of the parents to discuss the bilingual immersion program and answer questions. In addition, for the first two days, parents were invited to attend an informal get-together to discuss the program. At these meetings, Edison and CLEAR staff provided the parents with additional information. Media coverage during the first weeks of the fall semester was used to publicize the program and to assist in the recruiting strategy.

In the spring, 1986 semester, Edison began another recruitment and public relations effort. Fliers advertising classroom visitations in the bilingual immersion classrooms were sent to prospective parents and preschools. Interested individuals could visit the classrooms on Thursday mornings from 10:00 - 12:00. A number of individuals visited the various classrooms. Also, as an innovative recruitment strategy, Edison teachers and the principal designed a T-shirt that was sold to the students at Edison and other interested individuals. The T-shirt read on the front, "I ♥ BECOMING BILINGUAL AT EDISON," and on the back, "YO ♥ SER BILINGÜE EN EDISON."

Enrollment into the bilingual immersion program was voluntary and required the parent's signature on a consent form. Students not placed in the bilingual immersion program were enrolled into the regular mainstream educational program at Edison.

Professional Development Related to the Bilingual Immersion Program

Preservice training was given to the Edison teachers, the principal, and the Title VII coordinator, by staff of CLEAR and the California State Department of Education. The major goals of the preservice training were to introduce the participants to the rationale for bilingual immersion, provide them with an understanding of the major components underlying the bilingual immersion model (e.g., sheltered language instruction, cooperative learning, home/school collaboration, etc.), and help them with curriculum planning.

The administrators and teachers also attended a CLEAR Seminar on Teaching in Bilingual Immersion Programs. The purpose of this seminar was to bring together teachers and principals from the four schools that implemented a bilingual immersion program in 1985-86 to discuss instructional strategies, materials, curriculum, and recruitment plans.

Other professional development activities included seminars on learning how to use the Student Oral Language Observation Matrix (SOLOM); discussions of problems associated with the bilingual immersion model; and inservice workshops on testing instructions, testing procedures, recruitment strategies, obtaining additional funding, and related matters.

CLEAR also produced five reports for the parents, teachers, and administrative staff that summarized testing activities and results to date. In addition, CLEAR attended and participated in all of the parent and Board of Education meetings where the bilingual immersion program was discussed.

Finally, CLEAR prepared a proposal requesting funding for Edison School's bilingual immersion program that was submitted to numerous corporations by the school principal. Also, Edison School's program was described in a nationally distributed CLEAR Directory of Bilingual Immersion Programs (Lindholm, 1987a).

Class Composition

The goal of classroom composition was 67% Limited English Proficient (LEP) native Spanish speakers and 33% Fluent English Proficient (FEP) speakers. With the exception of one first-grade classroom, this goal was met in the first year of program implementation. The classroom composition for each class is listed in Table 1. Many of the FEP students were Spanish/English bilinguals, especially at the first-grade level. At the

Table 1

Classroom Composition:

Limited English Proficient (LEP) vs. Fluent English Proficient (FEP)

	LEP	(%)	FEP	(%)	Total
Kindergarten:					
Class 1	17	(61)	11	(39)	28
Class 2	19	(63)	11	(37)	30
Totals	36	(62)	22	(38)	58
First:					
Class 3	19	(70)	8	(30)	27
Class 4	18	(67)	9	(33)	27
Totals	37	(69)	17	(31)	54

kindergarten level, 4 (7%) FEPS were Spanish/English bilinguals, and at the first-grade level, 10 (18%) FEPS were Spanish/English bilinguals.

Summary Program Description

In summary, the bilingual immersion program at Edison Elementary School sought to incorporate a number of elements known to be present in successful bilingual immersion programs. The program integrated language instruction with content instruction in the traditional academic areas, and provided for integrated classrooms with respect to language proficiency. Parents were involved in a positive collaborative relationship with teachers and administrators, and efforts were made to develop a positive social climate for the program within the school.

METHODOLOGY

Research Framework

The evaluation model, adapted from Cummins (1979) and Cortés (1986), was an interaction model with three main components: (1) Home Background Factors, or the non-school familial characteristics that affect the school context; (2) School Context, including two aspects of the school educational process (Instructional Characteristics, including instructional features, curriculum, and teaching styles; and Student Characteristics, including skills, strategies, attitudes, motivation and psychological functioning); and (3) Program Outcomes, including language proficiency, academic achievement, and psychosocial performance.

The evaluation model is illustrated in Figure 1. This is a complex model where many factors help to determine program outcomes. For example, the Home Background Factors influence the School Context components. Instructional Characteristics, in like manner, are related to Student Characteristics. It is the interrelationships among these different variables that influence Program Outcomes. This model served as the framework for formulating and testing hypotheses.

The focus of this report is on describing each component separately. Lindholm (forthcoming) presents information related to how the variables interact to produce particular program outcomes.

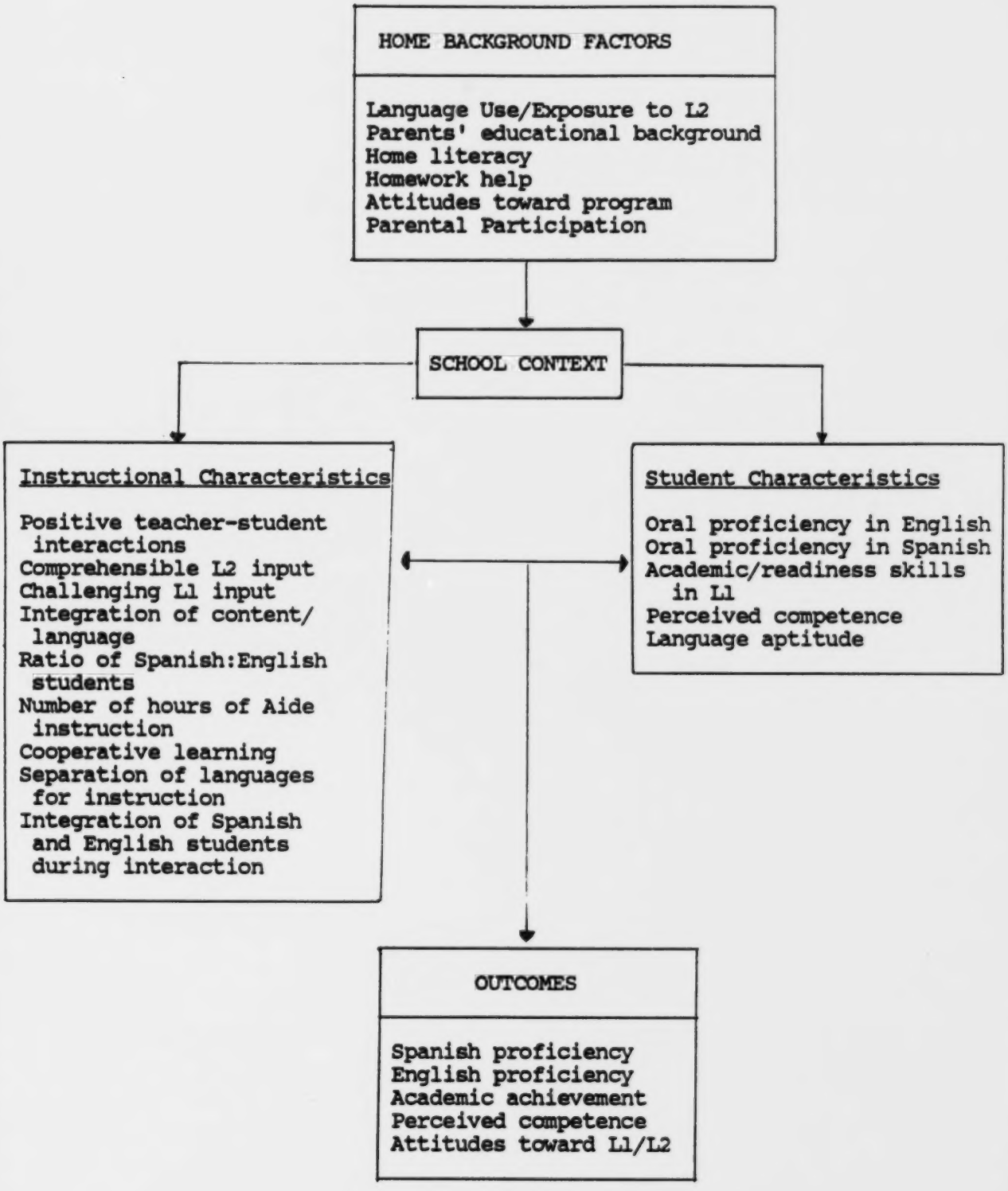

Figure 1. Evaluation Model Depicting the Variables and Their Proposed Relationships.

Research Questions

1. Student Characteristics:
   a. What are the students' language abilities and school performance as rated by their parents?
   b. What percentage of students attended preschool?
2. Home Background Factors:
   a. What are the education and occupation levels and language skills of the parents? How are they related to the language skills of their children?
3. Language and Literacy-Related Behaviors in the Home:
   a. What language(s) is (are) used in the home?
   b. How often are children read to by their parents? Do parents differ in whether they read to their children by language background (native Spanish vs. native English speakers) or grade (kindergarten vs. first)?
   c. What reading materials and what languages are used when parents read to their children?
   d. How frequently do families use the library?
   e. How frequently do parents help their children with homework?
4. Language Proficiency:
   a. How does the level of second language proficiency change after one year of Spanish instruction?
   b. How does the level of first language proficiency change after one year of Spanish instruction?
5. Achievement:
   a. What are the levels of math and reading achievement in Spanish?
   b. What are the levels of math and reading (and language, in first grade) achievement in English? Are there performance differences between bilingual versus non-bilingual immersion program participants in math and reading achievement in English?
   c. Are there achievement differences related to the grade level of the student (kindergarten vs. first grade) or native language background of the student (English vs. Spanish)?

6. Perceived Self Competence:
   a. What are the levels of academic, peer, physical and maternal/child relationship competencies?
   b. Do the students' self-assessments vary according to the grade level (kindergarten vs. first) or native language background (Spanish vs. English) of the students?
7. Attitudes toward the bilingual immersion program:
   a. What are the parents' attitudes toward the bilingual immersion program?
   b. What are the students' impressions of the bilingual immersion program?
   c. What are the Edison bilingual immersion staffs members' attitudes toward the bilingual immersion program?

Research Design

The design of the study utilized both survey and experimental components. In terms of the survey components, students' academic achievement was assessed at the end of the school year; parents completed a written interview schedule; and teachers and program administrators completed an evaluation questionnaire at the end of the school year.

The research design for the outcome evaluation was a 2 (grade level: kindergarten vs. first) x 2 (language group: Spanish vs. English) factorial design. For achievement test data in English, there was an additional factor of education group (bilingual immersion vs. non-bilingual immersion). For these latter data, then, the design was a 2 (grade level: kindergarten vs. first) x 3 (educational group: Spanish bilingual immersion vs. English bilingual immersion vs. non-bilingual immersion) factorial design.

Research Participants

Student Sample

In the first year, a total of 112 students participated in the bilingual immersion program research. Of these 112 students, 58 were kindergartners and 54 were first graders. In the two kindergarten classes, 36 (62%) were native Spanish speakers, 18 (31%) were native English speakers, and 4 (7%) were Spanish/English bilinguals. The two first grade classes contained 37 (69%) native Spanish-speaking students, 7 (13%) native English-speaking students and 10 (18%) Spanish/English bilingual students.

In a parental questionnaire (see questionnaire description under "Instrumentation"), 83 parents provided information about the children's preschool attendance, language ability, and school performance.

As Table 2 shows, most of the students attended preschool with slightly more first graders than kindergartners having gone to preschool. In terms of their language ability, almost all of the English speakers were rated as having more English than Spanish abilities. Of the Spanish-speaking students, approximately 25% were rated as bilingual and the remainder were rated as having more Spanish than English language skills. When the parents were asked whether their children had difficulty in understanding them when they used their native language, about 50% of the parents replied "never," most of the remainder responded "sometimes," and only a few parents indicated "often." Finally, in rating their children's school performance, most parents felt their children were doing "well" or "extremely well" and only a few said "average."

A sample of 39 LEP and EO students not enrolled in the bilingual immersion program formed a control group on the English academic achievement test (CTBS-U). This group was comprised of 20 kindergartners and 19 first graders.

Parent Sample

A total of 83 parents responded to the parental questionnaire. The parental questionnaire asked questions relating to the education level, occupation, Spanish and English ability, community involvement, and other parental characteristics. These data are presented in Table 3.

Occupation was classified using the Hollingshead (1965) Index of Social Position. This scale provided a numeric score for each type of job classification for statistical analysis. The mean occupation levels were 4.1 for fathers and 5.7 for mothers.

Two-way analyses of variance assessed whether the education levels of parents differed according to the grade level and language background of the student. Spanish- and English-speaking fathers differed in their levels of education. English-speaking and kindergarten fathers had more years of schooling than Spanish-speaking fathers ($F(1,82) = 34.4$, $p < .001$) and first-grade fathers ($F(1,82) = 4.5$, $p < .05$), respectively. Similarly, English-speaking and kindergarten mothers had more years of schooling than

Table 2

Percentages of Selected Student Characteristics

	Kindergartners		First Graders	
	English (n=14)	Spanish (n=28)	English (n=4)	Spanish (n=37)
Student Characteristics				
1. Attended preschool	71.4%	80.1%	100.0%	80.0%
2. Child's language ability:				
English better than Spanish	78.5	0.0	75.0	9.0
Spanish better than English	14.3	78.6	25.0	60.6
Bilingual	7.1	21.4	0.0	30.3
3. Difficulty understanding L1:				
Never	64.3	50.0	66.6	46.0
Sometimes	28.6	46.4	33.3	43.2
Often	7.1	3.6	0.0	10.8
4. Rating of school performance:				
Well to Extremely well	71.4	85.7	100.0	91.9
Average	28.6	14.3	0.0	5.4
Poorly to Very poorly	0.0	0.0	0.0	2.7

Table 3

Means and Percentages of Particular Parent Characteristics

	Kindergartners				First Graders				Total	
	English (n=14)		Spanish (n=28)		English (n=4)		Spanish (n=37)		(n=83)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Parent Characteristics										
1. Occupation-Father	3.1	2.1	4.5	2.4	2.6	3.3	2.7	4.3	4.1	2.5
2. Occupation-Mother	4.4	2.3	5.6	2.5	4.0	2.0	6.4	1.0	5.7	2.1
3. Education-Father	12.4	5.1	6.6	4.6	16.5	2.1	5.3	4.3	7.5	5.4
4. Education-Mother	12.9	3.1	6.7	4.5	15.5	3.1	6.1	3.1	7.9	4.7
5. Spanish language skills	3.1	1.3	4.4	1.6	3.0	1.4	4.8	0.5	4.3	1.3
6. English language skills	4.4	1.2	1.9	0.9	4.0	1.4	2.1	1.1	2.5	1.4
	Percent		Percent		Percent		Percent			
1. Education-Father:										
K-3	0.0%		24.4%		0.0%		28.0%			
4-9	7.7		50.4		0.0		49.6			
10-12	38.5		18.0		0.0		14.0			
College	53.8		7.2		100.0		8.4			
2. Education-Mother:										
K-3	0.0		25.2		0.0		19.6			
4-9	7.7		56.8		0.0		60.8			
10-12	38.5		7.2		0.0		14.0			
College	53.8		10.8		100.0		5.6			
3. Where educated:										
U.S.	76.9		7.4		50.0		12.1			
Other	23.1		92.6		50.0		87.9			
4. Spanish ability:										
Cannot/a little	50.0		0.0		50.0		0.0			
Communicate basic ideas	21.4		4.0		25.0		5.4			
Almost native/native	28.6		96.0		25.0		94.6			
5. English ability:										
Cannot/a little	7.1		76.9		25.0		64.9			
Comm basic ideas	7.1		19.2		0.0		24.3			
Almost native/Native	85.8		3.8		75.0		10.8			
6. Community Involvement:										
School committees	21.4		15.4		0.0		10.8			
Church	7.1		19.2		0.0		18.9			
Neighborhood/Other	28.6		7.7		25.0		2.7			
Combination	21.4		7.7		50.0		13.5			
None	21.4		50.0		25.0		54.1			
7. Level of school expect child to complete:										
High school	14.3		8.0		0.0		8.3			
College	85.7		92.0		100.0		91.7			

Note. The Hollingshead occupation scale ranged from 1 (higher executive and major professionals) to 7 (unskilled and unemployed). Education refers to number of years of schooling completed.

Spanish-speaking mothers ($F(1,82) = 47.8$, $p < .001$) and first-grade mothers ($F(1,82) = 5.3$, $p < .05$), respectively. English-speaking fathers and mothers were more likely to have gone to college and to have completed high school than were Spanish-speaking parents. About one fourth of the Spanish-speaking parents received three years of education or less, and another half never entered high school. These differences in level of education among the parents are important to recognize because research has shown that the educational level of the parent is highly correlated with student academic achievement (McGowan & Johnson, 1984). Finally, most of the Spanish-speaking parents were educated in Mexico while the majority of English-speaking parents were educated in the U.S.

Not surprisingly, the Spanish-speaking parents had more proficient skills in Spanish than the English-speaking parents ($F(1,82) = 20.6$, $p < .001$), and the English-speaking parents were more proficient in English than the Spanish-speaking parents ($F(1,82) = 65.0$, $p < .001$). Approximately 20% of the parents could at least communicate basic ideas in the non-native language, whereas over 50% could only communicate a little or not at all in the non-native language.

Concerning parents' expectation of the amount of schooling their child would complete, almost all (85% to 100%) parents replied that they wanted their child to go to college. No parents responded that they expected less than a high school graduation. Thus, all of the parents held high academic expectations for their children.

Language and Literacy-Related Behaviors in the Home

Information about language and literacy-related behaviors in the home was also obtained from the parent questionnaire. Table 4 shows that, overall, English was most likely to be used in English-speaking homes and Spanish in Spanish-speaking homes. In a few homes, both English and Spanish were spoken; and in one home, a language other than English or Spanish was used. Overall, few children were exposed to their second language in the home environment.

Several questions dealt with the parents' literacy interactions with the children. When asked whether they read to their children, most of the parents responded "yes," except for the Spanish-speaking kindergarten parents, where only 69% replied "yes." However, the frequency with which

Table 4

Percentage of Families Engaging in Particular Language and Literacy-Related Behaviors

	Kindergartners		First Graders	
	English (n=14)	Spanish (n=28)	English (n=4)	Spanish (n=37)
Language use in home:				
Only Spanish	7.1%	66.7%	25.0%	69.4%
Mostly Spanish	0.0	25.9	0.0	8.3
Spanish and English	14.3	7.4	0.0	22.2
Mostly English	28.6	0.0	50.0	0.0
Only English	42.9	0.0	25.0	0.0
Other	7.1	0.0	0.0	0.0
Read to child:	92.8	69.2	100.0	88.9
Frequency read to child:				
Daily	69.2	15.8	25.0	31.4
Once/twice week	23.1	36.8	50.0	37.1
Once in a while	7.7	47.4	25.0	31.4
What read to child:				
Children's books	63.6	73.7	33.3	40.0
Books	9.1	15.8	0.0	43.3
Other	0.0	5.3	0.0	6.7
Combination	27.3	5.3	67.6	10.0
Language read to child in:				
Spanish	7.7	82.6	25.0	85.3
English	61.5	0.0	25.0	2.9
Both	23.1	17.4	50.0	11.8
Other	7.7	0.0	0.0	0.0
Family uses library:	64.3	42.3	100.0	50.0
Homework help:				
Daily	71.4	44.4	75.0	55.6
Once a month	28.6	51.9	25.0	36.1
Never	0.0	3.7	0.0	8.3

the parents read to their children varied among the parents: English-speaking parents (mean = 3.8) read to their children more frequently than Spanish-speaking parents (mean = 2.7) ($F(1,82) = 11.2$, $p < .01$). Overall, though, the large majority of parents read at least once a week to their children. Most of these parents read "children's books" or a "combination" of reading materials. Also, most parents read to their children in their native language, and a few parents read in both Spanish and English. There was no difference between parents in the frequency with which they used the library.

Instrumentation

Home Background Questionnaire

The Home Background Questionnaire was developed by CLEAR staff to obtain information about: (1) the parents' educational backgrounds, (2) the parents' ability to speak Spanish and English, (3) the language interaction patterns between the child and various family members, (4) the parents' satisfaction with the bilingual immersion program, (5) the parents' ratings of their children's cognitive skills, (6) the literacy materials in the home in each language, and (7) the extent to which parents encouraged literacy in their children. The questionnaire was completed in either an English or a Spanish version, depending on the language facility of the parents.

Bilingual Immersion Project Questionnaire

The Bilingual Immersion Project Questionnaire was adapted from the California State Department of Education's Bilingual Immersion Project Teacher Questionnaire (Spring, 1986). The purpose of this questionnaire was to collect information relating to the teachers' and principals': (1) teaching authorization and experience; (2) in-service training; (3) satisfaction with the bilingual immersion program; (4) development of materials in Spanish; (5) impressions of the constraints to teaching in a bilingual immersion program; and (6) knowledge and attitudes toward bilingual education and the education of language minority students.

Comprehensive Tests of Basic Skills, Form U

The Comprehensive Tests of Basic Skills, Form U (CTBS-U) was a series of norm-referenced tests for grades K-12 (Comprehensive Tests of Basic Skills: Examiner's Manual, 1981a, 1981b,). The series was designed to

measure achievement in English in the basic skills normally found in U.S. curricula (i.e., reading, spelling, language, mathematics, reference skills, science, and social studies). Level A (Kindergarten) contained tests in two basic content areas: Reading and mathematics. These content areas were assessed in five separate subtests: (1) Visual Recognition, (2) Sound Recognition, (3) Vocabulary, (4) Oral Comprehension, and (5) Mathematics Concepts and Applications.

Level C (Grade 1) of the CTBS-U included tests in three basic content areas: Reading, language and mathematics. These content areas were measured in six separate subtests: (1) Word Attack, (2) Vocabulary, (3) Reading Comprehension, (4) Language Expression, (5) Mathematics Computation, and (6) Mathematics Concepts and Applications.

Norms on these tests were based on fall and spring national samples of students in the U.S. The combined fall and spring norming samples contained approximately 250,000 students in Grades K through 12 from public, Catholic, and private schools. In this norming sample, 6.1% of the students came from homes in which a language other than English was spoken most of the time (see CTBS Examiner's Manual, 1981a, 1981b).

Comprehensive Test of Basic Skills-Español

The Comprehensive Test of Basic Skills-Español (CTBS-Español) was a Spanish language adaptation of the English CTBS-S Reading and Mathematics achievement tests for grades 1-8 (Comprehensive Test of Basic Skills-Español: Examiner's Manual, 1978). It was developed by the Norwalk-La Mirada Unified School District in Southern California and consisted of five subtests: (1) Word Recognition I, (2) Word Recognition II, (3) Reading Comprehension, (4) Mathematics Concepts and Applications, and (5) Mathematics Computation.

In the standardization of the CTBS-Español, approximately 8,000 Spanish-speaking students in the United States took both the Spanish version and the English version (i.e., the CTBS-S). The norming information on the CTBS-Español was developed in terms of the national norms for the CTBS-S. Thus, the norm tables provided an estimate of the raw score that a student would have obtained on the CTBS-S, based on his or her raw score on the CTBS-Español, assuming basic competency in English and Spanish. This estimate was then compared to CTBS-S norms. Similarly, the percentiles were

not for the CTBS-Español; rather, assuming a basic competency in English and Spanish, they were estimates of the percentile a student with a given raw score on the CTBS-Español would have received if the CTBS-S had been taken.

La Prueba Riverside de Realización en Español

La Prueba Riverside de Realización en Español (La Prueba) consisted of a series of progressive tests designed to measure academic achievement in Grades K-9 for native Spanish speakers (Cole, Trent & Wadell, 1984). La Prueba was administered in Spanish and assessed students' progress in the basic skills of reading, language, mathematics, social studies, and science. La Prueba level 6 was designed primarily for kindergarten students; level 7 was designed primarily for first grade students.

Levels 6 and 7 measured basic skills in reading and mathematics via five subtests: (1) Reading Comprehension, (2) Vocabulary, (3) Word Study Skills, (4) Mathematics Computation, and (5) Mathematics Problem Solving. National norms were not developed largely because of the diverse and uneven distribution of Spanish-literate students in the United States. Instead, local reference group norms were developed. The norms used in this report were developed from testing 9,587 students in the Southwestern United States in kindergarten through eighth grade.

Bilingual Syntax Measure

The Bilingual Syntax Measure (BSM) assessed students' (in grades K-2) mastery of basic oral syntactic structures in both English and Spanish, using cartoon-like pictures and simple questions to elicit natural speech patterns (Burt, Dulay & Hernandez, 1976a,b). Scoring placed the students on a range from 1 to 6, with 1 corresponding to "no ability" in the language, and 6 representing "mastery." The test also categorized students into one of three proficiency levels in either or both languages: (1) A score of 1 or 2 yielded a classification of Non-English Proficient (NEP) or Non-Spanish Proficient (NSP); (2) A score of 3, 4, or 5 produced the classification of Limited English Proficient (LEP) or Limited Spanish Proficient (LSP); and (3) A score of 6 yielded a classification of Fluent English Proficient (FEP) or Fluent Spanish Proficient (FSP).

IDEA Proficiency Test

The IDEA Proficiency Test (IPT) placed students in one of seven oral language proficiency levels—from beginning to mastery—and assisted in the

classification of students according to relative levels of bilingualism (Ballard, Tighe, & Dalton, 1982; Dalton, 1980). The test was individually administered in both English and Spanish, and measured four basic areas of oral language proficiency: Vocabulary, comprehension, syntax, and verbal expression. With six levels of difficulty, the student could advance level-by-level until the test was completed, or stop at the proficiency level indicated by his or her performance. Also, as with the BSM, the IPT scores could be converted to the same three language proficiency categories: (1) Non-English Proficiency (NEP) and Non-Spanish Proficiency (NSP) were obtained when kindergartners scored a 1, or when first and second graders scored a 1 or 2; (2) Limited English Proficiency (LEP) and Limited Spanish Proficiency (LSP) were given to kindergartners with a score of 2, first graders with a score of 3, or second graders with scores of 3 or 4; and (3) Fluent English Proficiency (FEP) and Fluent Spanish Proficiency (FSP) were assigned to kindergartners who scored a 3 or higher, to first graders who scored a 4 or higher, and to second graders who scored a 5 or 6.

Student Oral Language Observation Matrix (SOLOM)

The Student Oral Language Observation Matrix (SOLOM) was a rating scale, developed by the California State Department of Education, that assessed children's Spanish oral language proficiency on a scale of 1 to 5 for five domains: (1) Comprehension, (2) Fluency, (3) Vocabulary, (4) Pronunciation, and (5) Grammar. Teachers did not administer a test, but reflected on the students' language abilities after extensive interactions with the student in a number of different situational contexts. The SOLOM resembles a matrix, with the five domains listed down the left-hand side of the matrix; in each domain there are five different levels of ability. The ability levels are described in boxes going across the page; each box represents a description of language behavior ability appropriate for a particular domain (e.g., grammar at ability level 2: "Grammar and word order errors make comprehension difficult. Must often rephrase or restrict what is said to basic patterns.") The scores ranged from 1, representing almost no ability, to 5, designating monolingual native speaker ability for each domain.

Perceived Competence Scale

The Pictorial Scale of Perceived Competence and Social Acceptance for Young Children (Perceived Competence Scale) was a self-report instrument that measured the child's sense of competence across four domains (cognitive, physical, peer and maternal), where each domain constituted a separate subscale of six items (Harter & Pike, 1983, 1984). Two overlapping versions of this individually administered scale were used, one for kindergartners and one for first and second graders. The cognitive competence domain contained a number of scholastic skills for first graders and rudimentary skills for kindergartners; the social competence subscale assessed the student's relationship with his or her peers; the physical competence subscale focused on competency in sports and outdoor games; and the maternal/child relationship competence domain consisted of particular maternal activities or behaviors that mothers engage in with four- to seven-year olds. Each of the 24 items was pictorially represented in a bound booklet of pictures. The child was read a brief statement about each child in the picture. He or she was first asked to pick the child who was most like him or her, and then to indicate, by pointing to the appropriate circle, whether that child was a lot like him or her (the big circle), or just a little like him or her (the smaller circle). Items were scored from 1 (low competence) to 4 (high competence).

Validity Checks

As noted above, much of the instrumentation was redundant in the sense that different scales assessed similar achievement skills and abilities. Positive relationships among these scales, therefore, indicated convergent validity among the various measures. In particular, both the BSM and the IPT were used to classify students' English and Spanish language proficiencies, and the SOLOM obtained teachers' ratings for students' Spanish language proficiency in four areas (Oral Comprehension, Fluency, Vocabulary, and Grammar.

Not surprisingly, Spanish BSM-Pre-Test and Spanish BSM-Post-Test scores were highly related ($r = .91$, $p < .001$); and the Spanish BSM-Post-Test was significantly related to the Spanish IPT score ($r = .51$, $p < .001$) and the SOLOM Total score ($r = .75$, $p < .001$). The correlation between the SOLOM total score and the BSM-Post-Test scores was similar to the correlations

(kindergarten: $r = .73$, first grade: $r = .71$) reported in a validity study of the SOLOM when it is used in English (Zehler, 1986). The English BSM-Pre-Test was positively related to the English BSM-Post Test ($r = .71$, $p < .001$); and the English BSM-Post-Test was positively correlated with the English IPT ($r = .54$, $p < .001$). The correlation between the SOLOM total scores and the Spanish IPT scores was also significant ($r = .54$, $p < .001$).

Procedures

In November and December, 1986, CLEAR individually administered the Perceived Competence Scale to all students in their native language. In May, 1987, CLEAR individually administered the IDEA Proficiency Test (IPT) to all children in both Spanish and English. All students also participated in achievement testing. The Santa Monica-Malibu Unified School District requires periodic assessments using the CTBS. Thus, all students were administered the CTBS-U and the La Prueba test in May and June, 1987, by their teachers. In addition, the CTBS-Español test was group-administered in October, 1986, and again in May, 1987, by the students' teachers. Students were also individually tested on the Bilingual Syntax Measure (BSM) in Spanish and in English in September and October, 1986, and again in May and June, 1987, by Santa Monica-Malibu Unified School District staff. As with most longitudinal studies, missing data arose because of student attrition, or absences on the days of data collection.

Teachers completed the Student Oral Language Observation Matrix (SOLOM) in January, 1987. The SOLOM was completed in terms of Spanish proficiency only. Also, in May, 1987, the teachers, the principal, and Title VII coordinator filled out the Bilingual Immersion Program Questionnaire.

Finally, the parent questionnaire was sent to the parents of all children in the bilingual immersion program in April, 1987. The questionnaires were accompanied by self-addressed and stamped envelopes for their return to CLEAR. Two meetings were held to help parents answer the questionnaire. Those parents who did not return the questionnaires within two weeks were called and asked if they would respond to the questionnaire over the phone.

RESULTS

Students' Language Competence

SOLOM Ratings

The Student Oral Language Observation Matrix (SOLOM) consisted of teachers' evaluations of students' oral language proficiency in Spanish in five domains. Average rankings for the kindergarten and first-grade children are presented in Table 5 and Figure 2. These data are presented separately for English dominant and Spanish dominant students.

From inspection of Table 5 and Figure 2, it is clear that teachers evaluated the Spanish language ability of the Spanish-dominant children much higher than that of the English-dominant children. This was true in both grade levels. Interestingly, English-dominant children tended to have higher rankings in comprehension and pronunciation than in fluency, vocabulary, or grammar.

Idea Proficiency Test

The Idea Proficiency Test examined students' language proficiency in both English and Spanish. Scores from the IPT were also used to categorize students, in terms of their language proficiency in each language, into one of three groups (non-proficient, limited proficient, and fluent proficient). Thus, each student was classified into one of three proficiency groups in both their dominant and non-dominant languages. Results are presented in Table 6.

Here, students consistently had superior scores in their dominant language. Among the kindergarten students, for example, 73% of the English-dominant, and 55% of the Spanish-dominant students were classified into the "fluent proficient" category (for their language of dominance). For the first graders, the corresponding percentages were 100% and 54%.

Spanish-dominant students also tended to be more proficient in their second language than English-dominant students in theirs. In the kindergarten, 40% of the English-dominant students, compared to 31% of the Spanish-dominant students, were classified as "non-proficient" in their respective second language. For the first graders, 100% of the English-dominant students, compared to 49% of the Spanish-dominant students, were classified as "non-proficient" in their respective second language.

Table 5

Mean SOLOM Ratings (and Standard Deviations) by Grade

For Native English and Native Spanish Speaking Students

	Kindergarten		First Grade	
SOLOM Domain	English (n=18)	Spanish (n=38)	English (n=7)	Spanish (n=44)
Oral Comprehension	2.4(1.3)	4.9(0.2)	2.0(1.7)	4.8(0.4)
Fluency	1.7(0.9)	4.8(0.4)	1.7(1.5)	4.6(0.7)
Vocabulary	1.9(1.1)	4.5(0.6)	1.9(1.6)	4.5(0.5)
Pronunciation	2.1(1.2)	4.4(0.8)	3.3(1.6)	4.9(0.3)
Grammar	1.7(0.9)	4.4(0.7)	1.9(1.6)	4.8(0.4)

Note. The SOLOM domain scores are based on teacher ratings of students' Spanish language proficiency (1 = "almost no ability" to 5 = "monolingual native speaker ability").

Figure 2
Mean SOLOM Ratings in Spanish by Grade

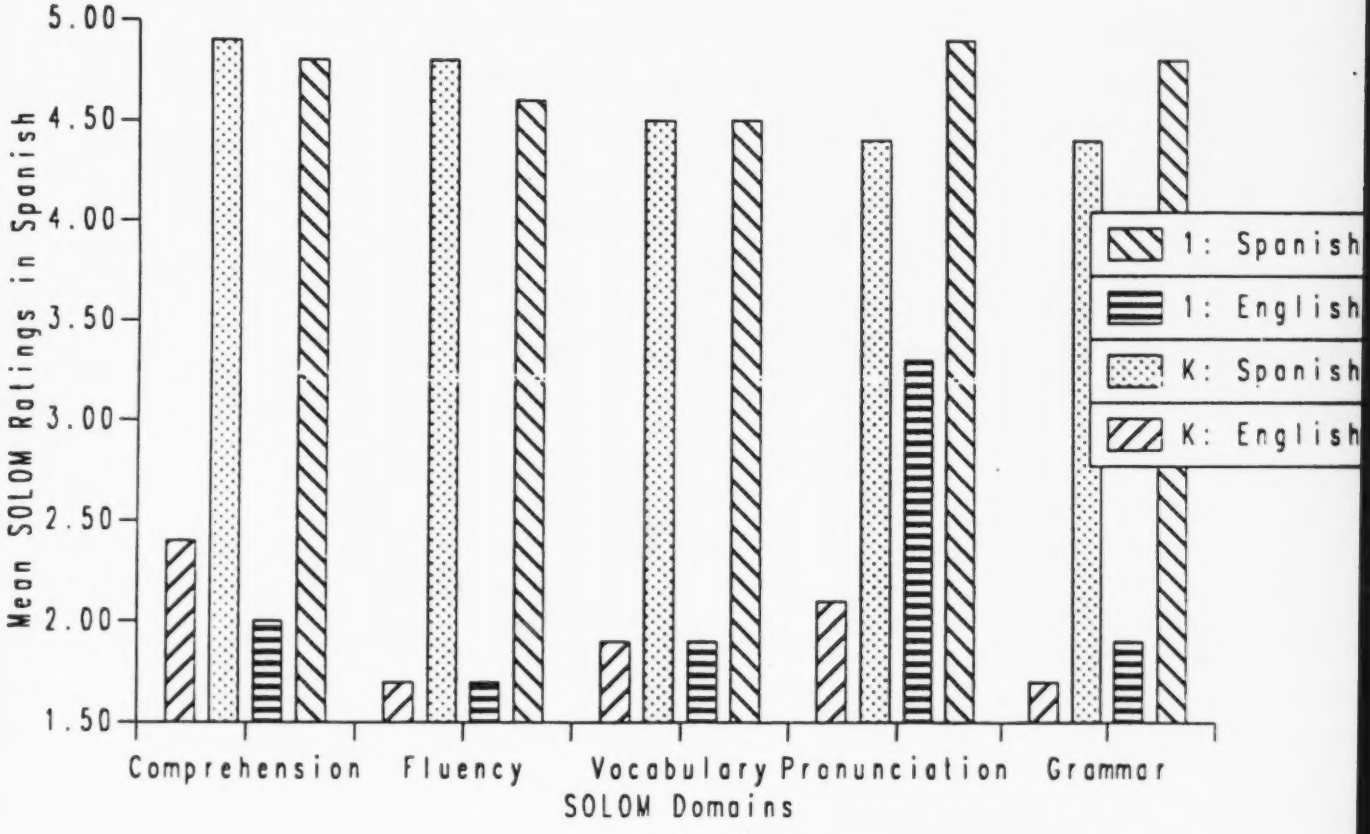

Table 6

Oral Language Proficiency After One Year: Findings From the Idea Proficiency Test By Grade and Language Group

Kindergarten (n's & %'s)			
First Language	**English**	**Spanish**	**Total**
Non-Proficient	0 (0.0)	1 (3.4)	1 (2.3)
Limited Proficient	4 (26.7)	12 (41.4)	16 (36.4)
Fluent Proficient	11 (73.3)	16 (55.2)	27 (61.4)
IPT Mean (SD)	3.9 (1.6)	2.9 (1.1)	
Second Language	**English**	**Spanish**	**Total**
Non-Proficient	6 (40.0)	9 (31.0)	15 (34.1)
Limited Proficient	8 (53.3)	16 (55.2)	24 (54.5)
Fluent Proficient	1 (6.7)	4 (13.8)	5 (11.4)
IPT Mean (SD)	1.7 (0.8)	1.9 (0.7)	
First Grade (n's & %'s)			
First Language	**English**	**Spanish**	**Total**
Non-Proficient	0 (0.0)	4 (9.3)	4 (8.2)
Limited Proficient	0 (0.0)	16 (37.2)	16 (32.7)
Fluent Proficient	6 (100.0)	23 (53.5)	29 (59.2)
IPT Mean (SD)	5.5 (1.4)	4.0 (1.5)	
Second Language	**English**	**Spanish**	**Total**
Non-Proficient	6 (100.0)	21 (48.8)	27 (55.1)
Limited Proficient	0 (0.0)	12 (27.9)	12 (24.5)
Fluent Proficient	0 (0.0)	10 (23.3)	10 (20.4)
IPT Mean (SD)	1.8 (0.4)	2.7 (0.9)	

Note. Proficiency classifications are based on IPT scores.

Academic Achievement in Spanish (La Prueba)

The results from La Prueba Riverside de Realización en Español, the Spanish language achievement test that assessed reading and math performance (as well as a composite score), are presented in Table 7. Mean scores, percentile rankings, and stanine scores are presented separately for kindergarten and first grade, and separately for English-dominant and Spanish-dominant students. Figure 3 graphically presents the percentile ranks for the reading, math and composite scores for the kindergarten and first grade students.

Findings from La Prueba clearly indicated that students performed at average or above average levels (all of the stanine scores were 5 or above; and the percentile ranks were 49 or above). Most noteworthy was the performance of the English-dominant first graders in math, where their score was equivalent to a percentile rank of 83.

In addition, each of the scales in La Prueba consisted of several subscales. Table 8 presents the subscales in reading (i.e., comprehension, vocabulary, and word study skills) and mathematics (i.e., computation and problem solving), and the percentages of "correct responses" for each subscale. In concert with the findings for the mean scores from La Prueba, students correctly answered over half of the items on each subscale of the test. This level of performance corresponded to an "average" performance on all subscales, according to conversion tables provided by the test developers (see Cole et al., 1984).

One-way analyses of variance were conducted for each grade level on each of the three total scores to test for main effect of language group (Spanish vs. English). On all six of the ANOVAS, there were no significant differences between the Spanish and English speakers at either the kindergarten or first-grade levels.

Language Proficiency and Academic Achievement Gains

In order to ascertain gains in language proficiency and academic achievement for the bilingual immersion students, pre- and post-tests were obtained on the Bilingual Syntax Measure and the CTBS-Español. Also, comparison data were available from a control group of students who were not enrolled in the bilingual immersion program on the CTBS-U.

Table 7

La Prueba Mean Achievement Scores by Grade

For Native English and Native Spanish Speaking Students

	Kindergarten					
	English			Spanish		
	Mean (SD)	Rank	Stanine	Mean (SD)	Rank	Stanine
Totals						
Reading	19.0 (2.8)	49	5	19.3 (4.3)	49	5
Math	19.1 (2.9)	62	6	18.0 (3.5)	55	5
Composite	19.3 (2.1)	55	5	18.9 (3.3)	55	5
	First Grade					
	English			Spanish		
	Mean (SD)	Rank	Stanine	Mean (SD)	Rank	Stanine
Totals						
Reading	21.9 (3.0)	68	6	22.0 (4.2)	68	6
Math	21.9 (2.4)	83	7	19.8 (4.8)	64	6
Composite	22.1 (1.9)	76	6	21.1 (4.0)	74	6

Note. Ranks are percentile ranks; stanines have a potential range of 1 to 9 with a stanine equal to 5 considered "average." n's for English speaking students were 16 and 17 for kindergarten and first grade, respectively; n's for Spanish speaking students were 37 and 37 for kindergarten and first grade, respectively.

Figure 3
La Prueba Mean Percentile Ranks by Grade and Language Group

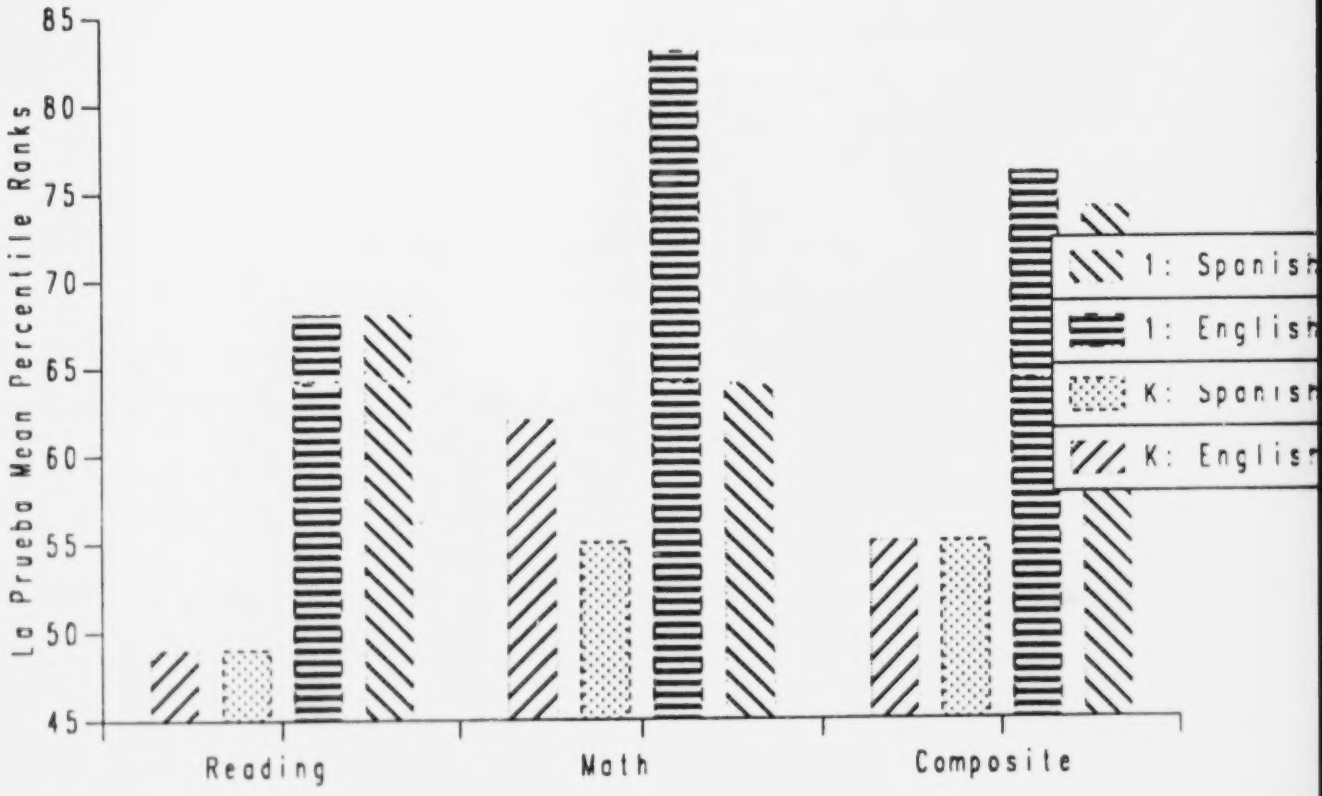

Table 8

La Prueba Percentages Correct by Grade

For Native English and Native Spanish Speaking Students

	Kindergarten	
	English (n=16)	Spanish (n=37)
Reading		
Comprehension	72.3	77.6
Vocabulary	65.6	59.5
Word Study Skills	81.0	82.1
Mathematics		
Computation	84.6	76.3
Problem Solving	64.4	65.5

	First Grade	
	English (n=17)	Spanish (n=37)
Reading		
Comprehension	85.6	81.6
Vocabulary	61.2	74.1
Word Study Skills	80.5	76.3
Mathematics		
Computation	89.2	81.3
Problem Solving	85.7	76.8

Note. Reading totals, math totals, and the composite totals are presented in Table [5, preceding]. All "percent correct" figures convert to "average" rankings according to norms for the La Prueba Achievement Test.

Bilingual Syntax Measure

The Bilingual Syntax Measure (BSM) assessed oral mastery in both Spanish and English. Pre-test, post-test, and gain scores are presented for each language by grade and language dominance in Table 9. Figures 4 and 5 provide a graphic representation of the pre-test and post-test BSM scores in Spanish and English, respectively.

Although students showed increases from the pre-test to the post-test in both English and Spanish, the only significant increases occurred for: (1) Spanish dominant kindergartners in Spanish proficiency; (2) Spanish-dominant kindergartners in English proficiency; and (3) Spanish-dominant first graders in English proficiency. Although Spanish-dominant and English-dominant children tended to have higher scores in their language of dominance, the largest gains in language proficiency occurred for English-dominant students in Spanish proficiency, and for Spanish-dominant students in English proficiency. In sum, none of the students experienced a loss in native language skills and most of the students experienced some gains in second language skills.

CTBS-Español (First Graders)

The CTBS-Español assessed academic achievement in a Spanish language instrument. Pre- and post-test data were collected for the first graders participating in the bilingual immersion program. Table 10 presents the pre-test and post-test percentile rankings and stanine scores for English-dominant and Spanish-dominant students. The percentile ranks for reading and math pre-test and post-test scores are depicted in Figure 6.

According to the percentile rankings at the pre-test and the post-test, students made striking gains in reading and mathematics. Among the English-dominant students, rankings in reading ranged from 24 to 71 at the pre-test, but 63 to 76 at the post-test. Thus, the students were performing above average at the post-testing. In mathematics, their achievement gains were even more dramatic. Pre-test rankings in mathematics ranged from 24 to 65, whereas post-test rankings ranged from 91 to 94. Grade equivalencies also demonstrated the fact that students began the program at or below grade level, but finished the program at or above grade level. However, these results should be interpreted with caution as the sample size was small ($n = 7$).

Table 9

Changes in Bilingual Syntax Measure

by Language Group and Grade

	Kindergarten		
	English Dominant	Spanish Dominant	Total
BSM: Spanish Language	(n=16)	(n=39)	(n=55)
Pre-Test	1.9 (1.4)	4.2 (0.8)	3.5 (1.4)
Post-Test	2.2 (1.6)	4.6 (0.5)	3.9 (1.5)
Gain	0.3 (0.6)	0.4 (0.7)*	0.4 (0.7)*
BSM: English Language	(n=14)	(n=39)	(n=53)
Pre-Test	4.0 (1.4)	1.6 (1.0)	2.2 (1.5)
Post-Test	4.0 (1.4)	2.5 (1.4)	2.9 (1.5)
Gain	0.0 (0.0)	0.9 (1.0)*	0.7 (1.0)*
	First Grade		
	English Dominant	Spanish Dominant	Total
BSM: Spanish Language	(n=6)	(n=53)	(n=59)
Pre-Test	2.7 (1.9)	4.9 (0.2)	4.7 (0.9)
Post-Test	3.5 (1.0)	5.0 (0.2)	4.8 (0.6)
Gain	0.8 (1.0)	0.0 (0.1)	0.1 (0.4)
BSM: English Language	(n=4)	(n=54)	(n=58)
Pre-Test	4.0 (1.4)	2.6 (1.4)	2.7 (1.4)
Post-Test	4.8 (0.5)	3.7 (1.0)	3.8 (1.0)
Gain	0.8 (1.5)	1.1 (1.2)*	1.0 (1.2)*

Note. BSM range is 1 (little or no ability) to 5 (native proficiency). Students achieving a 5 on the pre-test were assigned a 5 on the post-test. Gain scores marked with an asterisk (*) were significant with $p < .001$.

Figure 4
Changes in BSM Scores in Spanish by Grade and Language Group

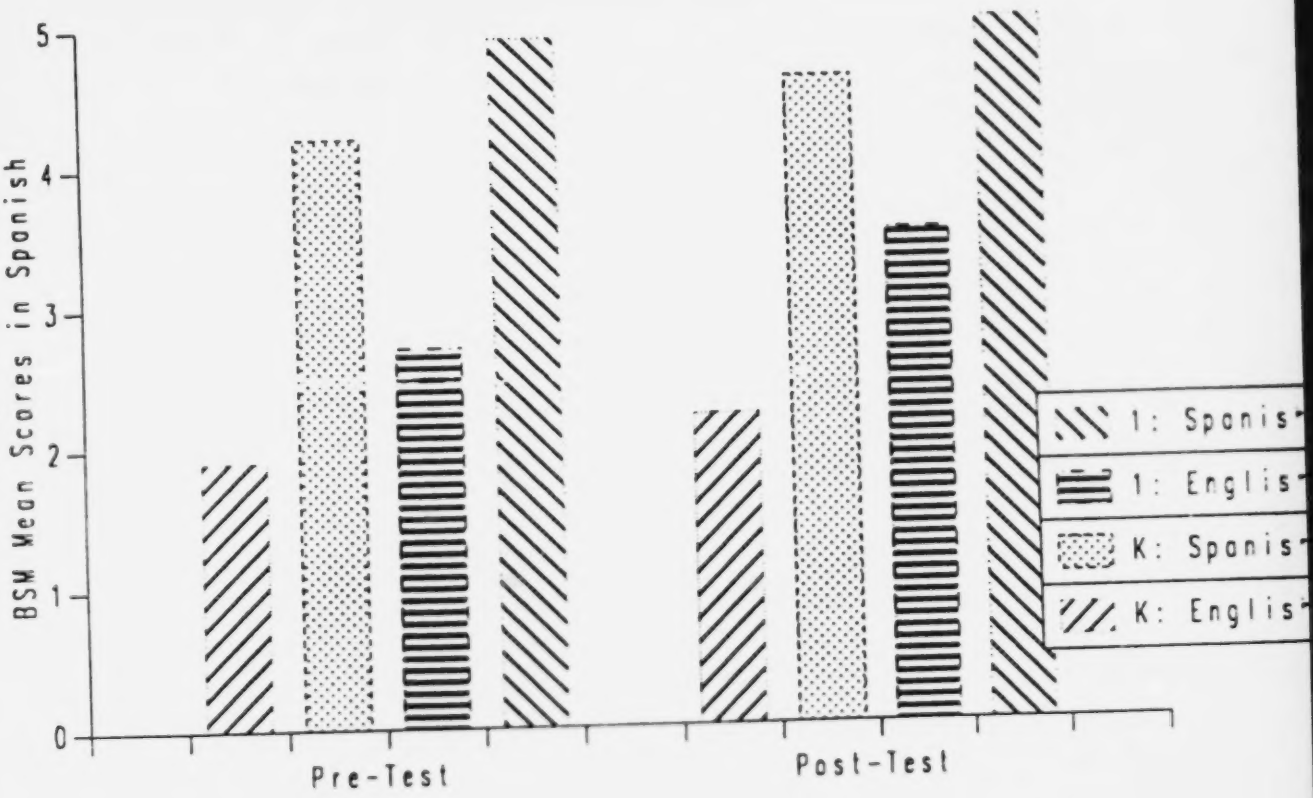

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Figure 5
Changes in BSM Scores in English by Grade and Language Group

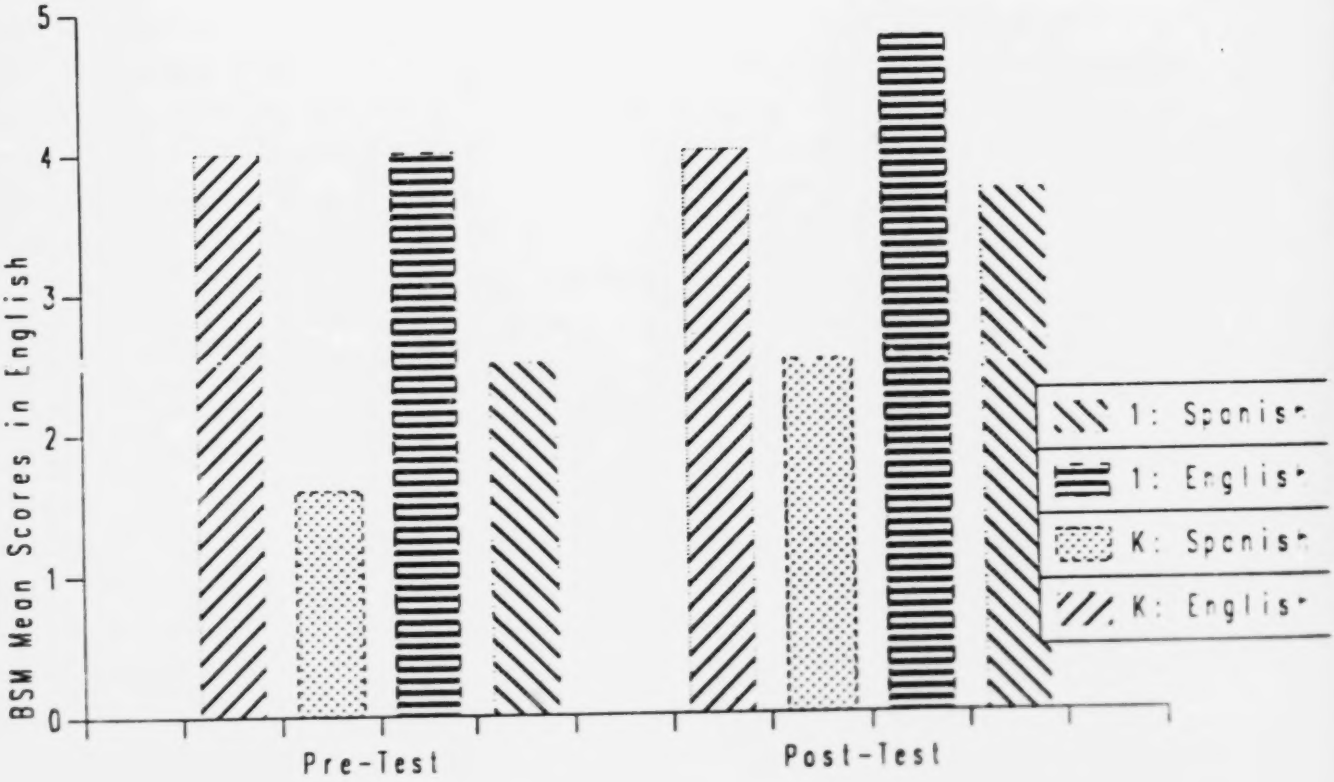

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Table 10

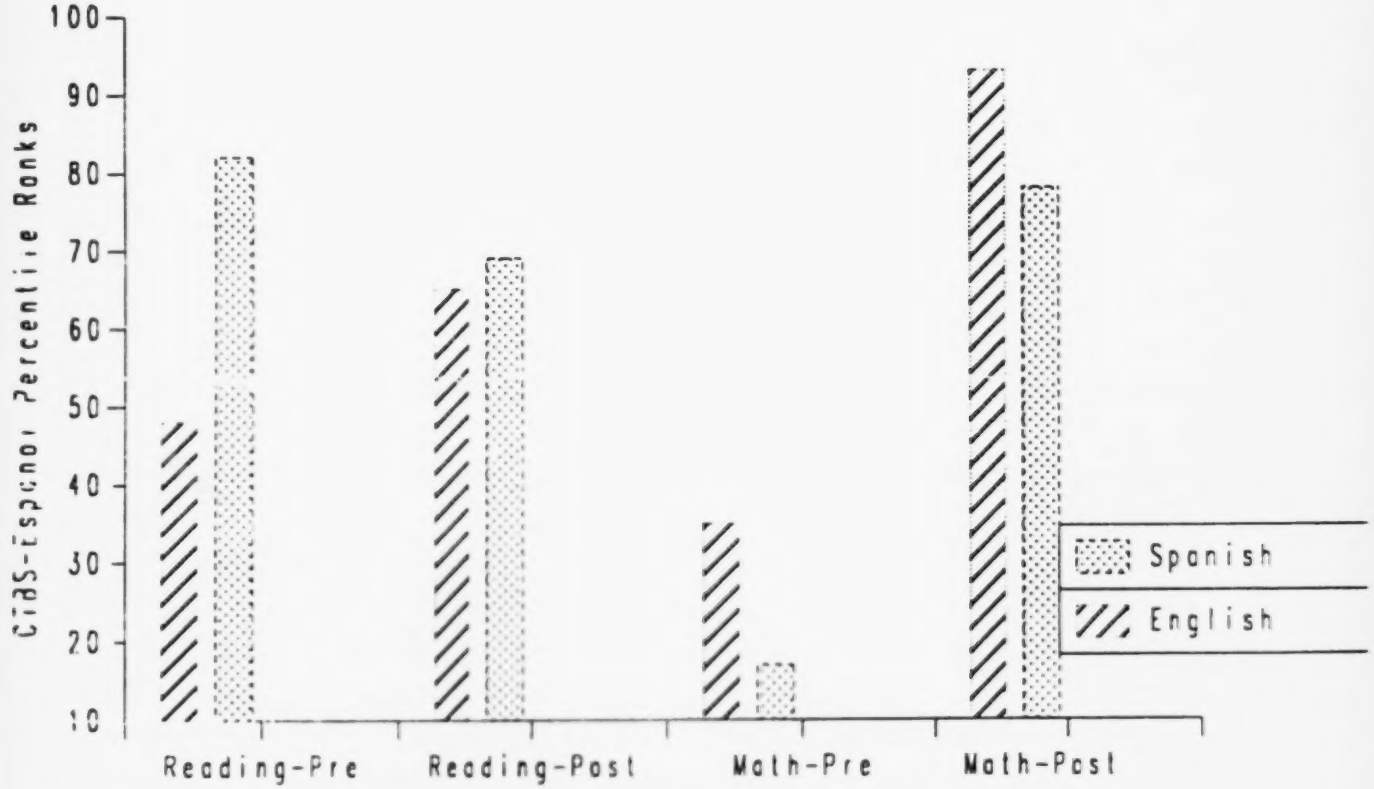
First Graders' Achievement Gains on the

CTBS-Español (Rankings and Stanines) by Language Group

	English Speaking Students (n = 16, 7)					
Reading	Pre-Test		G.E.	Post-Test		G.E.
Word Recognition I	71	6		76	6	
Word Recognition II	46	5		60	6	
Reading Comprehension	24	4		63	6	
Total	48	5	1.0	65	6	1.9
Mathematics						
Computation	65	6		94	8	
Concepts	24	4		91	8	
Total	35	4	0.6	93	8	2.8
	Spanish Speaking Students (n = 38, 34)					
Reading	Pre-Test		G.E.	Post-Test		G.E.
Word Recognition I	79	7		59	5	
Word Recognition II	84	7		75	6	
Reading Comprehension	55	5		73	6	
Total	82	7	1.5	69	6	2.0
Mathematics						
Computation	23	4		75	6	
Concepts	33	4		72	6	
Total	17	3	0.6	78	7	2.2

Note. n's in heading are for pre-test and post-test scores, respectively. Significance of mean differences in the pre-test and post-test scores are reported in Table 11. Numbers in the G.E. column are grade equivalencies, and are based on total mean scores.

Figure 6
First Graders' Percentile Rankings on CTBS-Espanol



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Among the Spanish-dominant students, equally impressive results were obtained in mathematics, although the reading percentile rank and stanine scores tended to decline from the pre-test to the post-test. Grade equivalencies showed the students performed above grade level in both math and reading at the post-test.

These gains in terms of percentile rankings, stanines, and grade equivalencies, were paralleled by gains in mean scores. Mean scores for each subscale of the CTBS-Español are presented in Table 11.

Here, English-dominant and Spanish-dominant first graders scored significant achievement gains in every subscale of the CTBS-Español [Math Computations: $t(42) = 11.8$, $p < .001$; Math Concepts: $t(40) = 12.2$, $p < .001$; Math Total: $t(40) = 14.8$, $p < .001$; Word Recognition I: $t(40) = 6.99$, $p < .001$; Word Recognition II: $t(40) = 10.1$, $p < .001$; Reading Comprehension: $t(40) = 15.3$, $p < .001$; Reading Total: $t(41) = 13.6$, $p < .001$] (see Table 11).

CTBS-U: Bilingual-Immersion vs. Non-Bilingual-Immersion

Bilingual-immersion students were compared to a sample of non-bilingual-immersion students on the CTBS-U. For the kindergarten students, comparisons were made across three groups (English-dominant bilingual-immersion, Spanish-dominant bilingual-immersion, and non-bilingual-immersion) for reading and math subscales of the CTBS-U. Findings from these comparisons are presented in Table 12, and the percentile ranks are depicted in Figure 7.

The significant differences (all with $p < .05$) in Table 12 were as follows: (1) the mean Visual Recognition score for the non-bilingual immersion (Non-BI) group (15.0) was higher than that for the Spanish dominant bilingual-immersion (Spanish BI) (11.6), but not higher than the mean for the English-dominant bilingual immersion (English BI) (13.6); (2) the mean Vocabulary score for the Non-BI (11.1) was higher than that for the Spanish BI (9.3), but not higher than the mean for the English BI (10.1); and (3) the mean Math Concepts score was higher for the English BI (9.8) than for the Spanish BI (7.0), but not higher than the math concepts score for the Non-BI group (8.8).

For the first-grade students, the same comparisons were made, as above, and for additional subscales in Language Expression, Math Computation, and a

Table 11

First Graders' Achievement Gains:

CTBS-Español (Means and Standard Deviations) by Language Group

English-Speaking Students (n = 16, 7)			
Reading	**Pre-Test**	**Post-Test**	**Gain**
Word Recognition I	9.7 (5.2)	19.0 (0.0)	9.3*
Word Recognition II	4.7 (3.6)	15.1 (3.6)	10.4**
Reading Comprehension	5.3 (3.9)	20.0 (2.0)	14.7**
Total	19.7 (7.7)	54.1 (5.1)	34.4**
Mathematics			
Computation	12.3 (11.2)	29.6 (2.6)	17.3*
Concepts	7.0 (3.4)	21.9 (1.8)	14.9**
Total	19.3 (10.9)	51.4 (3.6)	32.1**

Spanish-Speaking Students (n = 38, 34)			
Reading	**Pre-Test**	**Post-Test**	**Gain**
Word Recognition I	12.4 (5.5)	17.9 (2.6)	5.5**
Word Recognition II	8.9 (5.5)	17.5 (2.8)	8.6**
Reading Comprehension	7.7 (5.9)	21.9 (2.8)	14.2**
Total	28.3(15.1)	56.4 (9.9)	28.1**
Mathematics			
Computation	6.5 (5.7)	24.1 (9.3)	17.6**
Concepts	7.7 (4.2)	17.7 (5.6)	10.0**
Total	14.1 (8.7)	42.9 (12.4)	28.8**

Note. *n*'s in heading are for pre-test and post-test scores, respectively. Significance of gain scores assessed by single-sample *t*-tests.
* $p < .01$; ** $p < .001$

Table 12

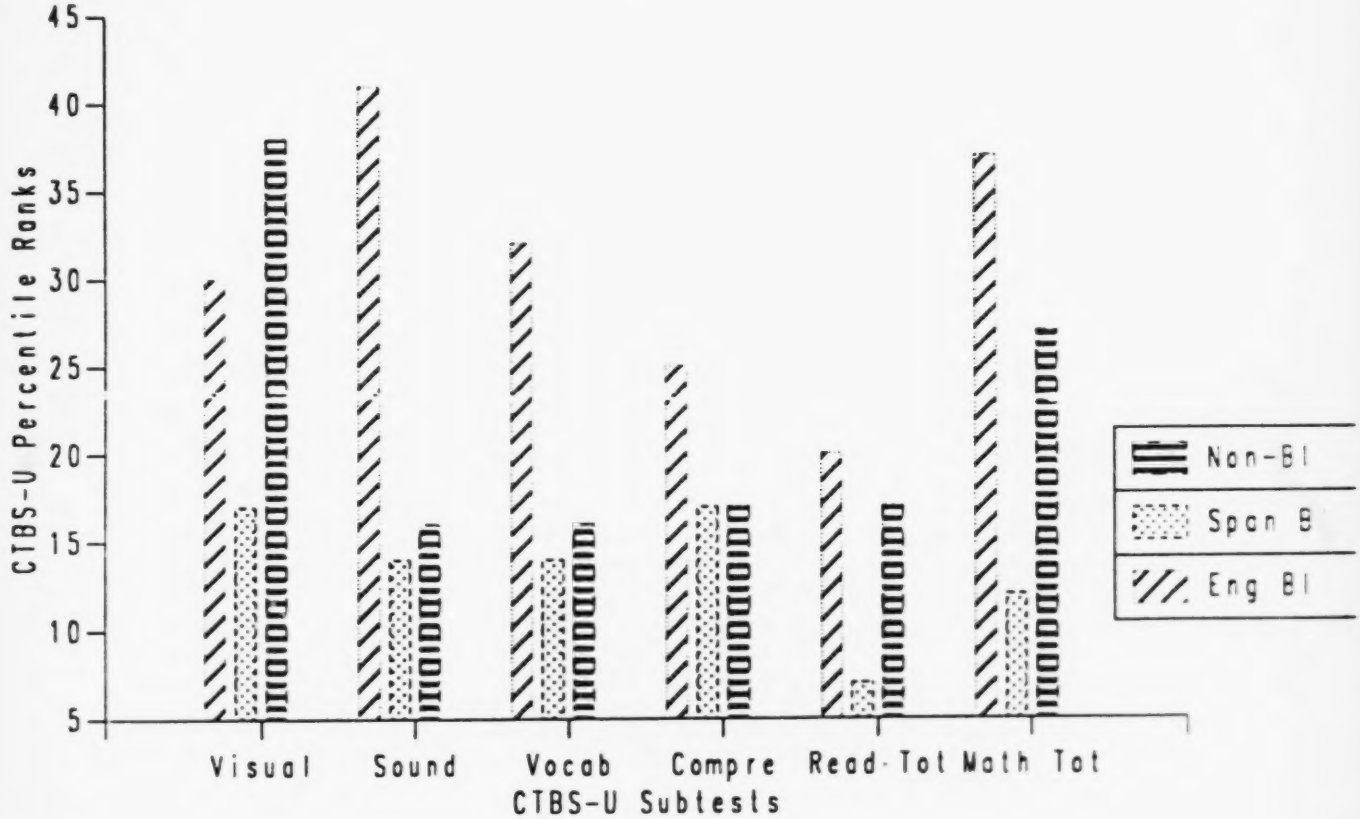
Kindergarten CTBS-U Achievement Scores for Bilingual Immersion and Non-Bilingual Immersion Students

(Means, Standard Deviations, Ranks, and Stanines)

	ENG BI (n = 16)			SPAN BI (n = 38)			NON-BI (n = 20)		
	Mean(SD)	R	ST	Mean(SD)	R	ST	Mean(SD)	R	ST
Reading									
I.*	13.6(4.9)	30	4	11.6(3.3)	17	3	15.0(2.5)	38	4
II.	11.8(3.5)	41	5	9.0(2.4)	14	3	11.0(3.7)	16	3
III.*	10.1(2.5)	32	4	9.3(2.6)	14	3	11.1(2.6)	48	5
IV.	10.3(2.5)	25	4	8.7(2.7)	17	3	9.3(2.2)	17	3
V.	11.5(3.4)	20	3	9.7(2.8)	7	2	11.6(2.8)	17	3
Math									
VI.*	9.8(3.3)	37	4	7.0(3.6)	12	3	8.8(2.6)	27	4

Note. Roman Numberals are defined as follows: I = Visual Recognition; II = Sound Recognition; III = Vocabulary; IV = Oral Comprehension; V = Reading Total: Average of Vocabulary and Oral Comprehension; VI = Math Concepts. See text for discussion of significant group differences.

Figure 7
Kindergarten CTBS-U Percentile Rankings by Group



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Math Total. These data are presented in Table 13, and the percentile ranks are displayed in Figure 8.

Significant group differences emerged on the following subscales: (1) the English BI mean (20.7) was significantly higher than the Spanish BI mean (13.6) for Reading Vocabulary, but not significantly higher than the Non-BI mean (14.9); (2) the mean Language Expression was higher for the English BI group than the Spanish BI group (10.6), but not significantly greater than the Non-BI mean (12.3) for Language Expression; (3) The mean Math Concepts for the English BI group (22.4) was significantly higher than either the mean for the Spanish BI group (16.5) or the Non-BI group (17.5), although these latter two groups did not significantly differ; and (4) the mean Math Total for the English BI group (20.3) was significantly higher than the Non-BI mean (15.4), but not significantly higher than the Spanish BI mean (15.6).

Summary of Achievement Findings

In sum, the students performed at a satisfactory achievement level considering that the English speakers were instructed in a second language and received only 10% of their instructional day in English language arts, and the Spanish speakers were instructed almost totally in their first language with only 10% of the instructional day spent in language arts in their second language.

Spanish speakers performed average to above average on Spanish achievement tests. In addition, they made significant progress over the year as measured by the gains from the CTBS-Español pre-test to the post-test. On English-language achievement tests, the kindergartners scored below average as expected for their level of English instruction. However, by first grade, the students performed only slightly below average. In fact, they were functioning only slightly below grade level and did not differ significantly from the non-bilingual immersion students except on one subtest for the Spanish speakers. This was an impressive result considering the small amount of English instruction they received.

Similarly, the English-speaking students did very well on both English and Spanish achievement tests. On the Spanish tests, the kindergartners scored average in reading and on the composite, and slightly above average in math. The first graders scored slightly above average in reading and on

Table 13

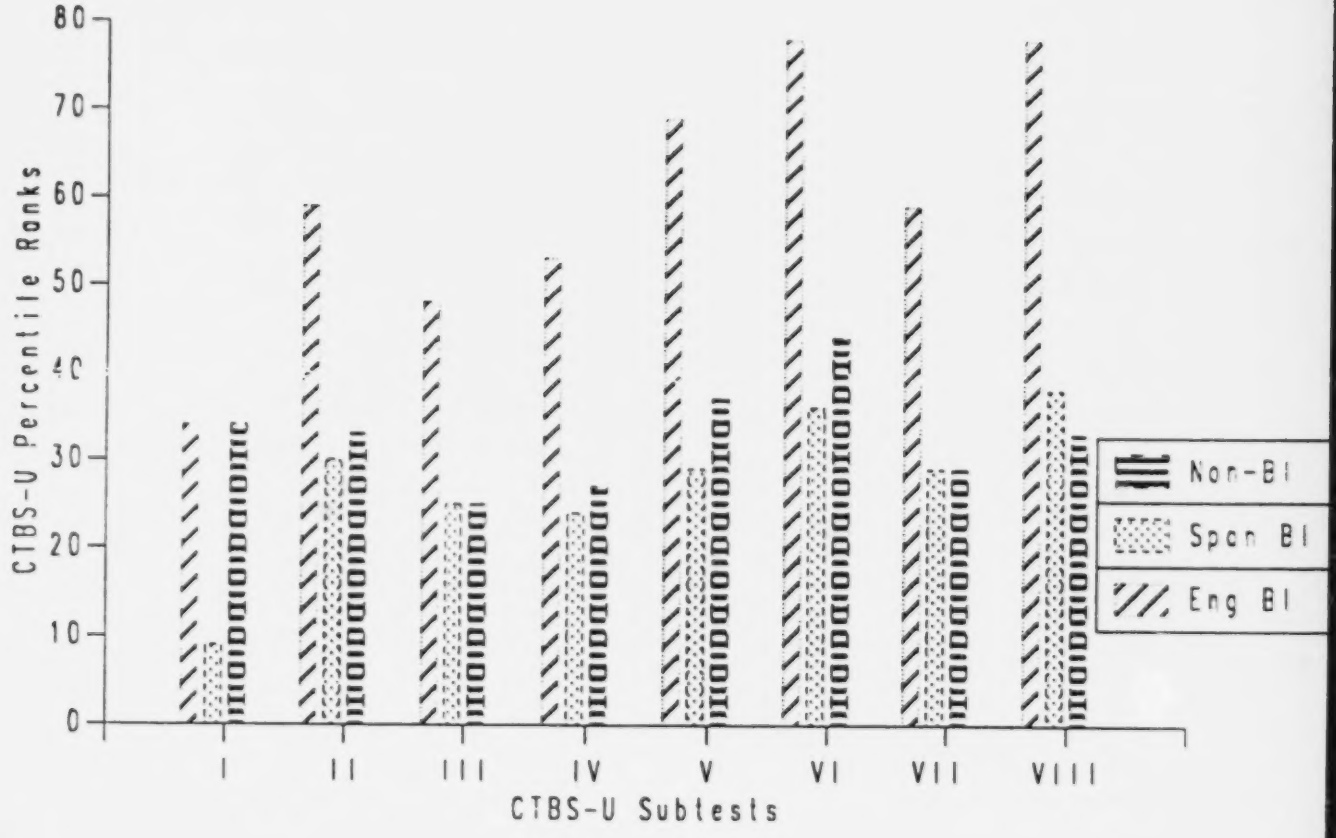
First Grade CTBS-U Achievement Scores for Bilingual Immersion and Non-Bilingual Immersion Students

(Means, Standard Deviations, Grade Equivalencies, Ranks, and Stanines)

	ENG B-I (n = 7)				SPAN B-I (n = 47)				NON-BI (n = 19)			
	Mean(SD)	G.E.	R	ST	Mean(SD)	G.E.	R	ST	Mean(SD)	G.E.	R	ST
Reading												
I.	23.0(6.4)	na	34	4	19.1(6.0)	na	9	3	22.9(5.1)	na	34	4
II.*	20.7(4.6)	1.9	59	5	13.6(7.8)	1.5	30	4	14.9(6.2)	1.5	33	4
III.	17.6(4.2)	2.5	48	5	13.5(7.5)	1.4	25	4	13.9(6.4)	1.3	25	4
IV.	19.1(4.2)	1.8	53	5	13.5(7.3)	1.5	24	4	14.5(5.5)	1.5	27	4
Language												
V.*	16.1(4.9)	1.8	69	6	10.6(5.7)	1.4	29	4	12.3(5.4)	1.5	37	4
Math												
VI.*	22.4(1.8)	2.4	78	7	16.5(6.6)	1.6	36	4	17.5(4.5)	1.4	44	5
VII.	18.1(1.9)	1.9	59	5	14.2(6.8)	1.4	29	4	13.6(5.1)	1.3	29	4
VIII.*	20.3(1.7)	2.1	78	7	15.6(6.7)	1.5	38	4	15.4(4.8)	1.5	33	4

Note. Roman numerals are defined as follows: I = Word Attack; II = Vocabulary; III = Reading Comprehension; IV = Reading Total: Average of Reading Comprehension and Vocabulary; V = Language Expression; VI = Math Concepts; VII = Math Computation; VIII = Math Total. G.E. refers to Grade Equivalence, R to Percentile Rank, and ST to Stanine. See text for description of significant differences.

Figure 8
First Grade CTBS-U Percentile Rankings by Group



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the composite, but well above average in math. Also, the students scored significantly higher on the CTBS-Español post-test than on the pre-test. In terms of English achievement, the kindergartners scored slightly below average on all subtests, but their scores did not differ significantly from those of the non-bilingual immersion students. Performance was even better at the first-grade level where reading and language scores were average and math scores ranged from slightly above average to well above average. Furthermore, on every subtest, they scored higher than the non-bilingual immersion students, with significantly higher scores in math.

Perceived Competence

Table 14 presents the results for the Perceived Competence Scale. This scale provided a measure of the students' perception of their academic, physical and peer competencies and their perception of their relationship with their mother. Because there was only one significant difference between the kindergartners and first graders, and none between English and Spanish speakers in all of the domains and on the total score, the results are presented in summary form.

Table 14 shows that the mean score for the cognitive domain was 3.5 for kindergartners and 3.4 for first graders, which represents a high level (given a possible range of 1 to 4) of perceived competence related to academic functioning in the students. These mean scores are equivalent to mean scores obtained from another sample of kindergarten (3.6) and first-grade (3.4) students (Harter & Pike, 1984). In Harter and Pike's sample, the 56 kindergarten and 65 first-grade students were middle-class and largely (96%) non-Hispanic Whites. Similar scores were obtained on the physical domain, where almost all of the children felt that they were competent with respect to their physical skills and abilities in outdoor games and activities (mean = 3.5). Again, these mean scores are almost identical to the mean scores obtained by Harter and Pike's sample of kindergarten and first graders (mean = 3.4). A mean score of 3.2 and 3.1 was obtained for kindergarten and first-grade students, respectively, in the peer domain, also demonstrating that the students perceived themselves as having a fairly high level of competence in relating to their friends and classmates. Harter and Pike's sample of kindergarten and first-grade students obtained mean scores of 2.9 and 3.1, respectively. Finally, the

Table 14

Perceived Competence Scores (Means and Standard Deviations) by Grade For Native English and Native Spanish Speaking Students

	Kindergarten		
	English	Spanish	Total
Cognitive	3.6 (0.5)	3.3 (0.3)	3.5 (0.4)
Physical	3.6 (0.4)	3.4 (0.3)	3.5 (0.4)
Peer	3.2 (0.7)	3.2 (0.5)	3.2 (0.6)
Maternal	3.3 (0.6)	3.2 (0.4)	3.2 (0.5)
Total	3.4 (0.4)	3.3 (0.3)	3.3 (0.4)
	First Grade		
	English	Spanish	Total
Cognitive	3.4 (0.4)	3.4 (0.5)	3.4 (0.4)
Physical	3.3 (0.4)	3.6 (0.4)	3.5 (0.4)
Peer	2.9 (0.5)	3.1 (0.6)	3.1 (0.6)
Maternal	2.6 (0.7)	2.9 (0.5)	2.9 (0.5)
Total	3.1 (0.2)	3.3 (0.4)	3.2 (0.4)

Note. n's for the English-speaking students were 19 and 7 for the kindergarten and first grades, respectively; n's for the Spanish-speaking students were 27 and 41 for the kindergarten and first grades, respectively. All scale scores had potential ranges of 1 to 4. The only significant group difference was for overall grade effects, where the kindergartners had significantly higher maternal perceived competence scores than the first graders ($F(1,93) = 11.44$, $p < .01$).

mean score obtained in the maternal domain was 3.3 for kindergartners and 2.9 for first-graders. This was the only domain in which there was a significant difference between students, with kindergartners scoring significantly higher than first graders ($F(1,93) = 11.44$, $p < .01$). Comparing the mean scores to Harter and Pike's students yielded slightly higher mean scores for the Edison students over Harter and Pike's kindergarten (mean = 2.9) and first-grade (mean = 2.8) students.

In sum, the kindergarten and first-grade students consistently presented high levels of perceived competence in each of the domains assessed. In fact, their mean scores compared very favorably with the mean scores of children in Harter and Pike's sample who were middle class English speakers.

Parents' Attitudes toward the Bilingual Immersion Program

The parent questionnaire requested information about the parents' satisfaction with the bilingual immersion program. Three questions sought ratings of the program, two addressed the parent's satisfaction with the student's ability to use each language, one focussed on whether Spanish instruction had hindered or helped English language development, and one examined the child's enjoyment of learning in Spanish. Table 15 presents the mean scores and standard deviations for these questions.

Table 15 shows that the level of satisfaction with the program was fairly high with a total mean score of 5.6, and a standard deviation of 1.8. When asked whether they would recommend the program to other parents, 73% of the parents responded "Yes, absolutely," 12% answered "Yes, with some reservation," and 15% replied "No." About 82% of Spanish-speaking and 93% of English-speaking parents said they would recommend the program to other parents. Of the twelve parents who responded "no," 11 were Spanish-speaking parents and all were parents of first graders. These parents felt that their children were not receiving enough English instruction as discussed below.

Regarding the question of whether they expected more or less from the bilingual immersion program, the overall rating was 3.8, which corresponded to "neutral." This may have been due to their high expectations for the children's ability to use both languages, or it could be reflective of their overall satisfaction with the program. In responding to the question

Table 15

Mean Scores for Parental Attitudes toward Bilingual Immersion Program by Grade

For Native English and Spanish Speaking Students

	Kindergarten				First Grade				Total	
	English (n=14)		Spanish (n=28)		English (n=4)		Spanish (n=37)		(n=83)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Satisfaction with program of Spanish instruction.[a]	5.4	1.6	5.4	2.1	6.0	0.6	5.8	1.8	5.6	1.8
Expected more or less.[b]	3.8	1.3	4.0	0.8	4.0	0.8	3.7	1.3	3.8	1.1
Satisfaction with child's ability to use Spanish.[a]	5.9	1.2	5.4	2.2	4.8	2.1	6.0	1.6	5.7	1.8
Satisfaction with child's ability to use English.[a]	6.3	0.9	4.7	2.4	6.0	0.8	4.7	1.9	5.0	2.0*
Learning in Spanish has hindered/helped progress in English.[c]	4.0	1.2	4.4	1.7	4.0	0.8	3.8	2.1	4.0	1.8
Child enjoys Spanish.[d]	5.4	1.5	5.4	1.9	6.3	1.5	5.2	1.9	5.3	1.8

[a] Scale ranges from 1 (very dissatisfied) to 7 (very satisfied).
[b] Scale ranges from 1 (expected a lot more) to 7 (expected a lot less).
[c] Scale ranges from 1 (has hindered his/her progress in English very much) to 7 (has helped his/her English very much).
[d] Scale ranges from 1 (dislikes it very much) to 7 (likes it very much).
* $p < .001$ for English vs. Spanish comparison.

regarding their satisfaction with the child's ability to use Spanish, the overall mean rating was 5.7, which corresponded to "a little satisfied." Similarly, the overall mean rating was 5.0 when the parents were asked about their satisfaction regarding the child's ability to use English. However, on this measure, the English-speaking parents (mean = 6.2) were more satisfied than were the Spanish-speaking parents (mean = 4.6) ($F(1,79) = 8.17$, $p < 01$).

Parents were also asked about whether the program of Spanish instruction had hindered or helped their children's progress in English. Responses to this question were fairly similar across parents, with a mean score of 4.0, corresponding to the "neutral" response. Finally, parents were asked to rate the extent to which the child enjoyed learning through Spanish. The overall mean score for this question was 5.3, which coincided with the response "likes it a little."

In general, it appeared that the large majority of parents were satisfied with the bilingual immersion program.

Edison Bilingual Immersion Staff Attitudes toward the Bilingual Immersion Program

Attitudes toward the Bilingual Immersion Program

On the questionnaire that was given to the teachers and principal, two items requested their satisfaction of, and enthusiasm for, teaching in the bilingual immersion program. When asked, in general, how satisfied they were with the way the current bilingual immersion program was operating, the mean response was 4.4, with a standard deviation of .49 (scale = 1 to 5; 1 = very dissatisfied, 5 = very satisfied), showing a high level of satisfaction with the current bilingual immersion program.

When asked about their enthusiasm for the bilingual immersion program, the mean response was 4.8 with a standard deviation of .44 (scale = 1 to 5; 1 = strongly disagree, 5 = strongly agree). This high level of enthusiasm was verified in a discussion of the bilingual immersion program at the Seminar on Teaching in Bilingual Immersion Programs; most teachers felt that bilingual immersion was an excellent educational model for both native English and native Spanish speakers.

Constraints to Teaching in a Bilingual Immersion Program

A number of items related to constraints to teaching in a bilingual immersion program. One set of seven items sought the teachers' perceptions of the level of support they received from different individuals affecting the bilingual immersion teacher, either directly (e.g., principal, non-bilingual immersion teacher) or indirectly (e.g., Board of Education). On a scale of 1 to 5, the average score was about 4 (agree). The administrative leadership support was rated high (4 to 5), but perceived support from other non-bilingual immersion teachers was rated as low overall, both in terms of non-bilingual immersion teachers' information about, and attitudes toward, the bilingual immersion program.

Thus, overall, the teachers felt that there was a positive level of support for the program by the administrative leadership, but a low level of support by other staff. Teachers also replied that there was a lack of Spanish materials or other instructional resources. A couple of teachers commented that the quantity of Spanish materials was not a problem, but the quality of materials was a definite constraint.

SUMMARY, RECOMMENDATIONS, AND CONCLUSIONS

Summary

This report presented the results of a study of Edison Elementary School after its first year of implementing the bilingual immersion program. The major research questions sought to determine: (1) the levels of first and second language proficiency and whether there were gains in first and second language proficiency over the year; (2) the levels of math and reading achievement in Spanish and English and whether there were achievement differences related to the language background of the students; (3) the levels of students' perceived academic, peer, physical and maternal competencies; and (4) attitudes toward the bilingual immersion program among the parents and staff. One research question which was not addressed here involved the cross-cultural attitudes of the students. Cross-cultural attitudes were not assessed because an instrument to measure cross-cultural attitudes in five- and six-year old children was not available. However, an instrument is under development and cross-cultural attitudes will be measured in the second year (1987-88 academic year) of Edison's bilingual immersion program.

A total of 112 kindergarten (n = 58) and first-grade (n = 54) students participated in the study. Data were gathered on English and Spanish proficiency with pre- and post-test measures; English and Spanish achievement, with pre- and post-test measures in Spanish; and perceived competence. In addition, the data collection included a parent questionnaire and a bilingual immersion staff questionnaire. Also, 20 kindergarten and 19 first-grade students who were not enrolled in the bilingual immersion program were tested using the English achievement test.

In terms of the students' language development, all of the students made gains in both languages. Native language proficiency was high, with about two thirds of the students rated at the Fluent Proficiency level, and one third at the Limited Proficiency level. Second language proficiency varied considerably, with some students rated at the Non-Proficient level, others at the Limited Proficient level, and still others at the Fluent Proficient level. More Spanish-dominant students were fluent in the second language than were English-dominant students.

Both the Spanish-dominant and English-dominant students scored at an average to above average level in achievement performance. The Spanish-dominant speakers scored in the average to above average range on Spanish achievement tests and made significant gains from the fall to the spring. Even the English-dominant students scored well on the Spanish achievement tests; the kindergartners scored average in reading and slightly above average in math, but the first graders scored above average in reading and well above average in math. In addition, the first graders made significant progress from the fall to the spring. On English achievement tests, the Spanish-dominant kindergartners scored low, but the first graders performed only slightly below average according to their stanine scores, and they did not differ significantly from the non-bilingual immersion students. The English-dominant kindergartners scored slightly below average, but the first graders performed average in reading and language and slightly above average to well above average in math. Furthermore, on every subtest, the English-dominant first graders scored higher than the non-bilingual immersion students, with significantly higher scores in math.

The students' perceived competence ratings were high in each of four domains (academic, peer, physical, and maternal); and attitudes toward the

bilingual immersion program were generally positive from the parents and teachers.

Recommendations

Four recommendations can be made to further develop the bilingual immersion program at Edison. The first recommendation involves promoting strong leadership and ownership of the program among the teachers. As indicated previously, the two first-grade teachers made a change in the program that was inconsistent with the model (i.e., the same teacher was providing both Spanish and English instruction). This change occurred because the teachers were not knowledgeable enough about the rationale for the model, despite pre-service training that discussed the rationale. Thus, it would be helpful if the bilingual immersion staff were to form a team with each team member becoming an expert on a particular aspect of the program.

A second recommendation is to develop a Spanish language arts component that will provide for greater development of the vocabulary and grammar skills of both Spanish-speaking and English-speaking students. These two areas are the ones which are most problematic for immersion students in general (Swain, 1987), and which received the lowest scores overall in the testing and rating of the Edison students' language proficiency.

Third, a clear curriculum for English language arts must be developed that is consistent within grade levels and that articulates across grade levels. A fourth recommendation involves the provision of more opportunities for native English and native Spanish speakers to interact in group work to promote language development and positive cross-cultural attitudes. These four recommendations may involve some in-service training in second language development, the rationale for bilingual immersion education, and cooperative learning.

Conclusions

Edison's bilingual immersion program was designed in concordance with the successful ten-year-old Spanish/English Bilingual Immersion Program in the San Diego City Schools. Its instructional design was based on a careful review of the literature on successful bilingual and immersion education programs in the United States and Canada as discussed previously.

Edison's bilingual immersion program design compares favorably with other bilingual immersion programs around the country. This is not surprising as Edison's program design was based on an existing bilingual immersion program and in coordination with three other new bilingual immersion programs in California with CLEAR and the California State Department of Education. Although Edison's program design met the criterial features defined for bilingual immersion education (Lindholm, 1987a), the program, as it was implemented last year, did not meet all the criteria as one might expect after only one year of program implementation.

The evaluation of the bilingual immersion program required collection of several kinds of data (see Figure 1, page 17). Data were collected on achievement in Spanish and English, language proficiency, self-competence, and parental background.

A longitudinal/cross-sectional design as comprehensive as the one used naturally included some weaknesses. The first was that the collection of so much data in a two-month period in the spring may have been overtaxing for some children, which may have depressed their scores. A second weakness, missing data due to student absences, student dropout and late enrollments, is inherent in longitudinal research. A third weakness involved the reliance on test data, which may or may not accurately reflect the actual language and academic performance and gains of the students. Finally, another weakness was that students were classified as either native Spanish speakers or native English speakers. Actually, there were four bilingual kindergartners and 10 bilingual first graders in the study who were classified as English speakers for the purposes of analyses. It is commonplace in educational research to use the dichotomous classification of English Only/FEP and Spanish/LEP in data analyses without attempting to determine the level of bilingualism in each student. However, bilinguals may actually inflate or deflate scores on particular measures.

There were also a number of strengths in the design. First, because the design is longitudinal and involves different measures of language achievement and other student characteristics, it enabled a better understanding of the variables that interact to produce various achievement outcomes. Second, by using measures that overlapped in content (two measures of Spanish achievement, Spanish proficiency, English proficiency),

validity studies were conducted to determine whether students who performed well on one test also performed well on a related measure. Third, collecting information on the language proficiency of the students in both languages enabled a better understanding of the relationship between bilingualism and academic achievement. Furthermore, analyses based on information about the dual language proficiency of the students can lead to more productive knowledge related to the achievement and language gains of students who are truly Spanish-dominant versus those who are English-dominant or bilingual.

Several important points should be made about the results that have implications for the bilingual immersion model. First, the Spanish speakers at both grade levels made highly significant gains in English, and the English speakers demonstrated some gain in English proficiency. Thus, despite the small amount of English instruction, most students were able to make gains in English language proficiency. Second, all students made gains in Spanish proficiency and the gains were highly significant for the Spanish-speaking kindergartners. These are important results because they demonstrate that the bilingual immersion model's assumptions related to language development were accurate; that is, Spanish speakers increased their level of Spanish proficiency and began to develop some proficiency in English, and English speakers did not lose their English proficiency while acquiring Spanish proficiency skills.

A second set of important points concerns the achievement performance of the students. First, the English-speaking students acquired enough content after only one year of instruction through Spanish to be able to score average to above average in a test normed for native Spanish speakers. Second, the Spanish speakers performed from average to above average on the Spanish achievement test, demonstrating a good level of performance for these students when tested in their native language. Third, the English-speaking kindergartners and the Spanish-speaking first graders scored average to only slightly below average in reading and math; and the English-speaking first graders scored average to above average in reading, language, and math. The fact that these students were able to score this high in English, despite having received their instruction in Spanish, demonstrates that the students were acquiring the math concepts in Spanish, and they were

able to apply these concepts when tested in English. Thus, the achievement results also validate the achievement assumptions underlying the bilingual immersion model in that the model assumes that content that is learned in Spanish will be available in English as well. The fact that the students were able to score as well as they did demonstrates that the concepts were available to them in both languages. However, an important caveat to add is that the sample sizes of the English-dominant first grade bilingual immersion group and the non-bilingual immersion students were small, which means that these findings must be interpreted with caution until further replication studies are conducted. In addition, it was difficult to obtain information on the background of the students in the control group. While most of these students were categorized as EO or FEP, there were some LEP students and several students whose status could not be confirmed in the school records.

The findings from Edison are comparable to the results reported by the San Diego City Schools (Lindholm, 1987a; ESEA Title VII Bilingual Demonstration Project, 1982) and three other bilingual immersion programs in California (e.g., Lindholm, 1987b). The consistency of the findings across other school sites also adds validity to the achievement and language assumptions underlying the bilingual immersion model.

In conclusion, the language proficiency and academic achievement first-year data demonstrated that the bilingual immersion model is an effective language education model for both language minority and language majority students. However, the success of the students over the next two to three years in acquiring academic competencies is contingent on the degree to which the program is fully developed according to the 13 criteria for successful bilingual immersion programs previously discussed.

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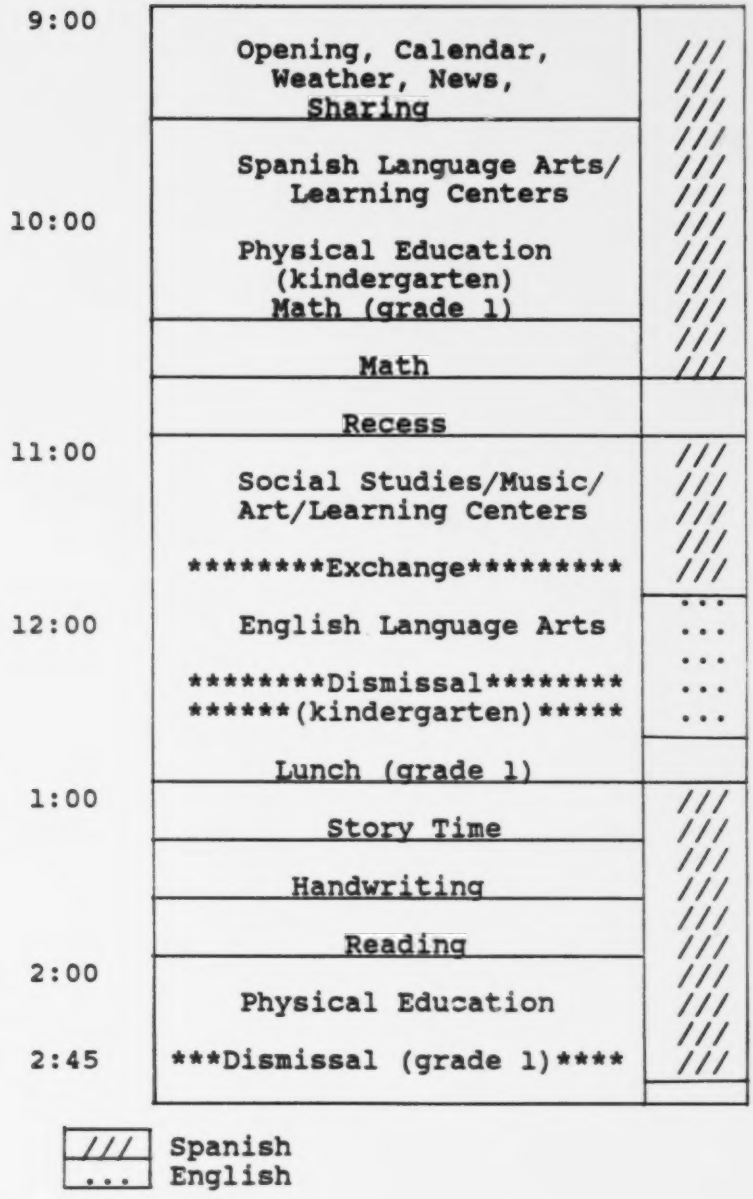
APPENDIX A
Sample Daily Schedule



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